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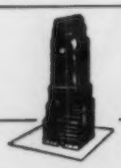

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EXPERIMENTAL ANALYSIS OF BEHAVIOR[1]

HARRY F. HARLOW

University of Wisconsin

IT is a privilege to be invited to appear before you on the occasion of the Semicentennial Celebration of the Establishment of the Psychological Laboratory of Saint Elizabeth's Hospital. The farsightedness of the program initiated in 1907 is evident in the prestige and leadership the laboratory has enjoyed in the field of clinical and abnormal psychology. At the time of its inception, the Psychological Laboratory was assigned the dual roles of diagnosis and research, and arrangements were made with George Washington University to provide for the mutual advantages that a mental hospital and academic psychology department can enjoy through cooperative enterprises. Its facilities were such even at the start that they would surpass those of some large mental hospitals of today. For one who regards himself as primarily a research psychologist, to be able to speak to a group with such rich research traditions is a pleasure, indeed.

It is my position that the experimental analysis of behavior is essentially the same whether we are dealing with the behavior of the paramecium or the man, whether we are analyzing behavior that appears to be simple or that which appears to be complex. As we ascend the phyletic scale, behavior becomes, or appears to become, progressively more intricate. The ultimate in apparent complexity is found at the human level, where we may measure indirectly such abstruse behavior as consciousness by using language as a dependent variable. Regardless, however, of the complexity of the behavior investigated, the fundamental techniques of the research psychologist are the same.

It is of interest to note that one of the pioneers in physiological and comparative psychology, a man who clearly recognized that the methods used in the experimental analysis of behavior were not species specific, was the first scientist to hold an appointment as psychologist on the staff of Saint Elizabeth's Hospital, Shepherd Ivory Franz. In William A. White's original report on the hospital's Psychological Laboratory in 1907 there are listed two published researches by Franz: one measuring the behavioral effects of brain abnormality in man, the other the effects of cortical lesions on learned behaviors in monkeys and cats. Franz pioneered in the experimental analysis of behavior in the subhuman animal following cortical lesions, using apparatus which yielded objective records and initiating controlled experimental designs. His willingness to translate experimental methods effective in studying the behavior of the brain-injured man to the brain-injured subhuman animal remains one of the great technological and methodological achievements of this past half-century.

[1] This paper was presented at the Semicentennial Celebration of the Establishment of the Psychological Laboratory of Saint Elizabeth's Hospital, April 20, 1957.

STUDY OF COMPLEX BEHAVIOR

The idea that the experimental analysis of behavior is independent of behavioral complexity is important and must not be lost. No behavior is too complicated to analyze experimentally, if only the proper techniques can be discovered and developed. Complex problems evade effective experimental analysis far less frequently than experimenters evade complex problems. Unfortunately, there are many areas in which the important problems are inherently intricate. The important problems in abnormal psychology, for example, will not be solved by safe and sane research.

Actually, complexity of behavior is not set by the species or by the response under investigation. There is no limit to the complexities of experimental analysis which may be employed in studying any animal or any response system. With subhuman forms we may complicate the analysis by introducing the variables of drastically altered anatomical and physiological state, as did Franz. Indeed, even with unicellular organisms, we may investigate the biochemical variables related to the organism's behavior, and there is no forseeable limit to the possible depth of analysis.

Let us restrict ourselves, however, to the problem of the experimental analysis of the behavior of the total organism. Less than 100 years have passed since large-scale, systematic studies of the behavior of man and of closely related animal forms were first attempted. Looking backward 25, 50, 75, or 100 years, one sees that the nature of behavioral investigations has changed, and the fundamental

changes have for the most part not been sudden or cataclysmic. They have appeared as trends, and these trends now are of such temporal length that they have some predictive power with regard to the direction which the experimental analysis of behavior will take in the future.

Insofar as the behavior of the total organism is concerned, there has been a trend, at least among psychologists, to attempt to analyze ever increasingly complex behavioral processes. Experimental psychology developed in large part from experimental physiology. One of the great figures of the era preceding the advent of experimental psychology was Hermann von Helmholtz. After measuring reaction time in peripheral nerves, he studied reaction time in the intact human being, the classical reaction time situation. But von Helmholtz abandoned these studies as being outside the domain of experimental science because of what appeared to him to be the intrinsic and capricious variability of the total, intact, human *S*. Simple, choice, and complex reaction time seem to us now to be completely within the domain of experimental investigation; indeed, to many of us these problems appear to be so simple as to be relatively unchallenging. We are no longer disturbed by human variability, and we have long since developed tools which we believe enable us to handle human variability in terms of precise, analytical, experimental designs.

Again referring to White's 1907 report, let me quote:

> It . . . becomes of the highest importance to investigate mental diseases upon their mental side and to study their origin and development by modifications of the methods of the psychological laboratory. While great expectations were entertained from the application of psychological methods to psychiatry, it was soon found that the accumulation of reaction time averages was of little value for the solution of psycho-pathological problems and that the methods of normal psychology must needs be modified to suit the changed conditions.

Now it may or may not be argued that we have fully accomplished the change in methods of normal psychology to such a point that all the psychological problems in the psychiatric field have attained solution. But, regardless of the progress made, psychological research in abnormal psychology has had a greater influence on reaction time studies than reaction time studies have had on abnormal research. The very attack on problems of complexity and importance often places specific psychological problems, apparatus, and procedures in perspective.

It is no accident that the kinds of behaviors which we classify as learning, thinking, motivation, and emotion were subjected to experimental analysis after the methods of studying more limited aspects of the behavior of the total organism had developed. Certainly the earlier experimental psychologists must have thought about these areas of human behavior, for they have long been described in common-sense language terms. The forefathers in our field must have left these areas relatively untouched, either fearful that they lacked the technical tools to investigate scientifically areas of such frightening complexity or believing that these areas were outside the pale of the *experimental* analysis of behavior.

Approximately 50 years passed from the inception of experimental psychology—the psychology of the individual—to the inception of experimental social psychology. Recourse to the pioneering textbooks in the field, such as Floyd Allport's *Social Psychology*, will make it apparent that early experimental social psychology differed in no very striking degree from the then existent experimental individual psychology. But once social psychology became an identifiable area populated by identifying people, the complexity of problems which were studied and the complexity of the groups whose behavior was subjected to experimental analysis progressively increased. There may be some who feel that the social psychologists have already gone too far in interpreting the complexities of group interactions and group behaviors which can properly be subjected to experimental analysis; but it is a very safe prediction that, even if they have gone too far in the past, they will go very much farther in the future.

It is doubtless improper for any one to set the limits of either individual or group behavior that is subjectable to experimental analysis. It is, however, an historical fact that psychologists have been subjecting ever more complicated behavior, individual or group, to experimental analysis. It is also a striking fact that they have been quite successful in discovering new techniques to facilitate their analyses. Furthermore, they have developed a wide range of supporting techniques, including new methods of experimental design and analysis, test and interview methods, and rating techniques. Doubtless many enthusiastic investigators have gone beyond the bounds of the experimental methods, but it would take a Solomon to assess exactly where these boundaries lie.

LONGITUDINAL APPROACH

A second obvious trend in the experimental analysis of behavior is the ever increasing importance being given to developmental investigations. Probably this is not an entirely independent trend, for the introduction of a major temporal variable into any research, field-observational or experimental, results in increasing complexity in the problem studied. Obviously, we are discussing here the trend to emphasize the longitudinal as opposed to the cross-sectional approach. It is apparent that we are not dealing with a dichotomy, but a scale. If we investigate the learning of a single problem, we are studying changes operating through time, even though this is a relatively brief period of time. Any transfer-of-training study can properly be regarded as longitudinal. Yet definitional matters aside, experimental psychology per se has traditionally been more concerned with the cross-sectional than with the longitudinal approach, and there has been, I believe, a tendency for experimental psychologists to think and plan in cross-sectional terms. In part this may be tradition, and in part it may have been imposed by necessity. Longitudinal studies are expensive; they are expensive financially, and they are expensive in personal demands and personal devotions. They are not easily adaptable to doctoral dissertations. Moreover, undertaking them always involves a risk that the methods will be outmoded by the time the study has been completed, for technical changes are rapid in many research areas. Regardless of the difficulties, the trend toward longitudinal orientation in the analysis of behavior will continue. All aspects of behavior—learning, thinking, emotions, motivations, and behavior deviations—are affected by developmental variables and can be fully understood only in ontogenetic perspective, and this is true at the subhuman level as well as at the human level.

It is not my intention to imply that only longitudinal studies are desirable or have validity. Many problems are not only amenable to cross-sectional methods, but must be attacked in that way. For example, if we wish to determine the effect of age per se on ability to solve an initial learning problem, we must attack it by presenting the problem to groups varying insofar as possible only in age. But if we are interested in the effects of early learning experiences on later learning facility, we must employ the longitudinal approach. It is not an accident that the increased interest in long-time developmental studies has followed decades of cross-sectional research. Aside from their expensiveness, long-time studies have another limitation: they are productive only after cross-sectional studies have provided necessary information about interrelationships among variables operating at any particular time in determining behavior. In a sense, the cross-sectional studies prepare the way for the longitudinal ones, and the trend toward longitudinal studies is in part a reflection of the coming of age of experimental psychology.

Having been raised as a pure experimentalist, in the experimental tradition, I have followed with interest the changes in my own research programs and the development of these programs. The experimental *S* that has consumed almost all my research time has been the rhesus monkey. When I initially approached the experimental analysis of this animal's behavior, I approached it in the classical, cross-sectional manner. My co-workers and I investigated how the macaque learned to solve a discrimination problem, a string-test problem, an oddity problem, even a single concept. If it had not been for the fact that my monkey *S*s continued to live after they had solved a problem and that they were not expendable in view of the available financial support, I might still be engaged in cross-sectional studies of the monkey's behavior. In fact, one criticism about my research that I encountered repeatedly was that my monkeys were not naive: they had had laboratory experiences prior to some problem about which I was currently reporting, and therefore my results, in the eyes of my critics, must be of questionable value. These same men were, of course, using the neonatal college Sophomores and Juniors as experimental *S*s. Then I discovered that the longevity of my *S*s was an asset to my research, not a liability.

Almost as much by accident as design, I ran one group of *S*s on a long series of discrimination problems rather than on a single problem. After all, the animals were there, and no more pressing problem presented itself at the time. Out of satisfying what seemed then to be a whim, we discovered a phenomenon with broad theoretical implications: the phenomenon of interproblem learning or, to use our term, the formation of learning sets.[2]

[2] Because this phenomenon has been frequently described, I merely refer to it in the printed form of the paper.

More recently, we have planned and initiated much more extensive longitudinal studies in which we have separated infant rhesus monkeys from their mothers at birth and raised them under the controlled conditions of the laboratory. We have been successful in raising over 50 of these young animals, and we have obtained data on their learning development from birth through three years of age. The monkey can learn conditioned shock responses and conditioned approach responses to a feeding booth during the first week of life. The rhesus infant masters, in a few trials, the single-unit Y maze at 15 days of age, and additional days of growth effect no improvement in performance. Tested in the Wisconsin General Test Apparatus, the monkey learns to discriminate between two stimulus objects very efficiently at 60 days of age, and performance approaches maximal efficiency at 120 days. The difficulty of the delayed response has probably been overrated; effective performance on this task first appears at about 125–150 days.

The ability to solve a single problem does not mean that the animal has the ability to transfer this learning to other problems of the same kind or class. The 120-day-old monkey that solves a single discrimination problem with adult efficiency transfers little or nothing to the next discrimination problem, the next 25 discrimination problems, or the next 100. Discrimination learning-set formation is still inefficient at 200 days of age, and full interproblem learning ability is not completed until late in the second or third year of life. In other words, a very considerable maturational gulf exists between single-problem learning and learning-set formation.

We know that the macaque monkey visually explores its environment from the first day of life onward, and we have some information as to the kind of stimuli which elicit these compelling responses. Both observational and experimental findings indicate that visual responsiveness to detail appears rather suddenly between the eighth and tenth days of life in individual monkeys. Associated with this development there is a burst of exploratory-manipulatory activity to detailed stimuli, and we are convinced that these externally elicited and motivated behavior patterns are dependent on maturation rather than learning. Researches presently being conducted by Robert Zimmerman show that the eight- to ten-day-old macaque suddenly becomes able to solve a black-white discrimination; and the first of these problems which it then faces, it solves rapidly. Other data obtained by Zimmerman indicate that the ability to discriminate between a triangle and a square matures a few days later; and when this transpires, the infant monkey is able to solve this form discrimination rapidly. Additional data suggest that after this first form discrimination is learned, primary stimulus generalization in the infant is similar or identical to that in the adult monkey. We believe that our data will presently end all speculation concerning the degree to which brightness discrimination, form discrimination, and color discrimination are acquired or innate.

We have found the longitudinal approach to the experimental analysis of behavior interesting and even exciting, and we are now extending this type of analysis to other areas than learning, perception, and motivation. Lorna Smith is tracing the development of the nonnutritive sucking responses. William Mason is tracing the development of social behaviors. And we are planning and conducting systematic longitudinal studies on the development of emotional responses.

INTERLABORATORY RESEARCH

A third trend in the experimental analysis of behavior is, I believe, the development of interlaboratory research. This is not a trend of long standing, nor is it a well-established policy developed in any formalized way discernible at the present time. But it is a trend which I believe has been developing, even if on an informal basis. Let me again illustrate from my own experience. The systematic study of subhuman primate behavior arose from the researches on the chimpanzee carried out at the Yerkes Laboratories of Primate Biology at Orange Park, Florida. When we began our researches on monkeys, we were properly and consciously influenced by the previous work of that organization. Many of our researches were designed to measure in the monkey what had already been measured in the chimpanzee. Subsequently, the Yerkes Laboratories have conducted certain complementary researches in which they have investigated in the chimpanzee certain behaviors, such as color vision and various complex kinds of learning, which we had studied in the monkey. At the present time we are initiating researches on the nature and development of patterns of emotion which are similar to,

and modeled after, researches by Hebb on the chimpanzee. This pattern of interlaboratory research in particular areas of psychology has been informal rather than directed, but it represents a pattern which is, I believe, becoming evident in many areas. More recently we have seen a directed pattern of interlaboratory research which may well serve as a model for future large-scale interlaboratory researches. This is the interinstitutional research being conducted by the Veterans Administration on the tranquilizing drugs. An attempt is presently being made to initiate another large-scale interdisciplinary and multi-institutional research program on conditions affecting susceptibility to cerebral palsy. The human cases are so few at any institution that only an interinstitutional program seems likely to yield the desired information. It is true that such a program goes beyond the experimental analysis of behavior, but it will certainly incorporate behavioral researches.

One aspect of this interlaboratory "collaboration" is the increasing frequency of symposia devoted to the discussion of specific problems or problem areas. Psychologists from all parts of the country and even the world have become more and more interested in gathering together to share their information, to give leads to other investigators that might further the attack on difficult problems. This pooling of information is doubtless saving research time and effort, not to mention funds, and accelerating progress in the field of psychology.

Twenty years ago a great many scientists lived with paranoid fears that their developing ideas would be stolen by their associates; now scientists of equivalent status live more in fear that their developing ideas will be ignored than that they will be stolen, and some are even eager to have their ideas stolen if the theft will be acknowledged in a footnote. It is a happy change that the scientist has come to think of himself as a social being, and his work as part of a social process.

COMMUNALITY OF EXPERIMENTAL METHOD

A fourth developmental trend relating to the experimental analysis of behavior is a conceptual trend: a developing belief that the experimental method as a method for the analysis of behavior is the common property of all behavioral scientists, not the exclusive right or exclusive prestige symbol of any one particular group.

The experimental method as operationally defined by most psychologists consists in reliably measuring some response variable, the dependent variable, and determining its functional relationships to other, independently manipulated variables. Frequently, but by no means necessarily, the independent variable is a stimulus variable. It is immediately apparent that this paradigm of the psychological experiment is very broad. The dependent variable can be a verbal report or verbal judgment; it can be an eye blink or finger flexion, a score on the two-hand coordinator or Brown spool packing test; it can be a total or partial score on the Stanford-Binet, the Rorschach, or the Szondi test. The independent variables are in all cases essentially unlimited: including scaled stimulating conditions, intervals between stimulation, conditions of past experience, alterations in physiological state, and maturational status of the *S*s.

It is obvious that, although experiments are all devised by the measurement of some dependent variable and the systematic manipulation of an independent variable, not all experiments are of equal value. There are wide degrees of difference in the precision with which various behaviors can be measured, i.e., in the reliability and objectivity of the measurement of the dependent variables. Likewise, the precision with which various independent variables can be scaled and controlled is by no means identical. Experiments differ in qualitative and quantitative excellence and may be evaluated by some highly objective criteria. Above and beyond this, there are more subtle criteria for judging the quality of experiments: the criteria of values. Value criteria are social criteria: they are determined by social norms, and they change with time. Whether or not we like these criteria, they have vast significance and can doubtless be measured with significant reliability. Psychologists both independently and as a social group have subjected many experiments to such evaluating devices. They have appraised experiments, elegant and inelegant, experiments employing the introspective method, Gestalt constructs, the 14-unit multiple T maze, or the Szondi test; and psychologists will continue this process.

ADAPTATION OF METHOD TO PROBLEMS

Perhaps there is a fifth developmental trend among psychologists, or at least a considerable body of psychologists: a trend to adapt method to prob-

lems, rather than to adapt problems to method. The deification of extremely rigid experimental method once threatened to lead to the exclusion of many problems of importance from the domain of the experimental analysis of behavior. There are classical instances in the past where the premature use of limited methods has blocked rather than facilitated the development of a new research area. For many classes of problems, simple observation methods may be more productive than rigid laboratory experiments using complex apparatus, especially during the exploratory phases of programmatic research. Actually, it should be emphasized that there is no sharp dichotomy between observational and experimental methods or between clinical and experimental methods.

At the present time, for example, we are interested in tracing the development of various patterns of emotional behavior in the rhesus monkey. We began by looking for response patterns which might fit into this rather broad category and noting the kinds of situations which elicited such behavior. But this observational study, like almost any observational study, is gradually taking on the characteristics of an experiment. As we gain sophistication about the monkey's emotional responses, we become more selective in the patterns which we observe, and we define our various dependent variables with increasing precision in the expectation of getting increased reliability. We learn that independent variables might be profitably exploited and gradually arrive at crude scales for quantifying these variables. We know at this point that we are using the experimental method, but we are not sure at exactly what stage the transition occurred. We have initiated formal experiments with rigid criteria for at least one of our emotional dependent variables, and we are trying to scale some of the independent variables that are functionally related. But we are open-minded as to whether or not formal experiments will give us as complete a picture of the nature and development of emotions in monkeys as we can obtain by supplementing the experimental data with essentially "pure" observational data.

Just as I believe there is no proper hierarchical system for ordering the various kinds of psychological methods, so do I believe that there should be no such system for ordering the various kinds of psychologists. Clinical psychologists, comparative psychologists, experimental psychologists, physiological psychologists, and social psychologists, insofar as they are interested and engaged in the experimental analysis of behavior, are all one family—happy family or not. None of these groups can with propriety set itself up as a sacred scientific society and assign to the others the role of secular groups enjoying only second-class psychological citizenship.

Results of importance bearing on the experimental analysis of behavior will be discovered by the use of various methods (both within and without the formal laboratory), by the aid of complex electronic apparatus or apparatus no more complex than the human brain and eye, by the use of experimental designs that are recondite and those which are naive, by the efforts of scientists who are intellectual giants and the efforts of scientists with more modest abilities. Different kinds of psychologists using very different methods will do golden- and silver-angel research; and, although I believe there should be no hierarchies among kinds of psychologists, I am convinced that there are and should be hierarchies in the values of the products which any and all kinds of psychologists produce. It is my opinion that golden-angel research will be best achieved if every psychologist feels that he is free to work on the problems which he believes are important, in the way which he thinks is appropriate, without feelings of deference. We need not worry too greatly about the techniques used or the capabilities of the men who first secure the intellectual beachheads. They will be followed by successive waves of silver-angels who will move in the heavy equipment, the Fisher-Yates tables, the Monroe calculators, and even the IBM machines and digital computors if the assault on the intellectual island is worthy of such logistic support. The grains of gold which were already uprooted from the sandy beaches will then be arranged in rows and columns, combinations and permutations, and eventually reconstructed and reassembled into intellectual coins which will be scientific legal tender for all time and all eternity. Whether or not anyone is interested at this time in the captured intellectual island, it can at least be left at a statistically significant level of confidence. And it is a pleasing thought that meanwhile other psychologists will be searching for and engaging in the experimental analysis of other areas of behavior, using (it is to be hoped) methods of their choosing, in the ways that give them personal satisfaction.

REPORT OF THE POLICY AND PLANNING BOARD: 1957

THE Policy and Planning Board makes the following report to the membership of the APA. We are proposing some changes in the structure of the organization that will require approval by the Council of Representatives in September. We are proposing changes in the By-Laws that will be submitted to the membership next fall by mail ballot. We have tried to define clearly some other problems, but both the precise problems, and steps toward their solution, have so far escaped us. All of our actions are properly before the entire membership for review before final action is taken.

The Policy and Planning Board held two meetings during the year, a one-day meeting in Chicago, November 18, 1956, and a two-day meeting as guests of the Massachusetts Institute of Technology at Endicott House, Dedham, on April 2 and 3, 1957. The first half day of the Spring meeting was held jointly with the Policy and Planning Committee of the Conference of State Psychological Associations (CSPA). Present in Chicago were: Bray, Carter, Hildreth, Lindsley, Newman, Raimy, Rogers, Sanford, and Wickens. The meeting at Dedham included: Bray, Carter, Hildreth, Lindsley, Newman, Raimy, Russell, Sanford, and Wickens; and Gustad, Langhorne, Matarazzo, McKinney, and Wischner from CSPA.

1. The proposals for changes in the membership structure of the APA have been put into final form. These proposals have already been reported to you in the April *American Psychologist*. The mail vote of the membership on the necessary changes in the By-Laws has just now been completed.

2. The Policy and Planning Board prepared a lengthy working paper on possible changes in the organization of the APA and sent copies of this to officers of divisions and of CSPA just before the September 1956 meeting in Chicago. The working paper was extensively discussed in Chicago, after which the Policy and Planning Board retired to lick its wounds and seek out the consensus that had been found. A number of suggestions and the range of that consensus are embodied in the proposals below. On one major proposal, the divisional structure of the APA, action has been postponed. The Policy and Planning Board hopes to present, in a subsequent report, the arguments that still convince us our work here is not finished, but we forego further discussion now.

3. The President of the APA is the one officer for which all members of the APA vote. It represents, therefore, the highest honor that can be conferred by the membership at large on a leading member of our profession. At the same time, it is an administrative position with heavy responsibilities and requires a substantial portion of an individual's time. Many members sense at times a conflict between these two requirements, and they would like to have their nominations, and their votes, serve only a single purpose: that of honoring a psychologist *qua* psychologist.

With this view the Policy and Planning Board agrees. It proposes, therefore, to reduce the obligations and responsibilities of the President to those that are honorific and symbolic of American psychology and to have the Board of Directors elect from among its own members a Chairman of the Board who would be the responsible administrative officer of the APA during his term of office. A detailed recommendation is given below in Appendix A.

4. When the present APA was formed in 1945, there were fewer than a dozen state psychological associations and it seemed appropriate to assign them a peripheral role in APA affairs. Provision was also made for a Conference of State Psychological Associations that would "serve as a medium of integration, mutual help, and exchange of information among State Psychological Associations." Today there are 47 state associations. The APA is faced with the necessity of integrating the state associations as important groups which speak for psychology. It is the strong conviction of the Policy and Planning Board that the state associations have an important place within APA and that the time has come to make structural changes to recognize this role.

There are two lines of evidence that convince the Policy and Planning Board that the time has come for action. On the one hand, psychologists have become increasingly occupied with detailed professional problems, many of which depend on local circumstances for their solution. Problems of state

legislation, background investigations in matters of professional ethics, the effort to improve conditions of employment of psychologists in state service, and the evaluation of some psychological service agencies are representative of these problems. Strong state psychological associations can be of great help to the APA in solving these problems, and it is desirable that they should be readily available. On the other hand, the state associations have felt an increasing need for uniform policy in dealing with their problems, both professional and scientific, and they have found their present channel of communication to top echelons of the APA somewhat less than adequate.

The solution proposed by the Policy and Planning Board embraces three proposals.

a. It is proposed that *state associations be given direct representation on the Council of Representatives.* At the present time they are represented indirectly through the CSPA. In order that the Council should not grow to unwieldy proportions, the following scheme of representation would be followed. Each state association having 100 or more APA members on its rolls would be entitled to elect one representative to the Council. Other state associations might form any mutually agreeable alliance for electing such a representative if their *combined* APA membership equalled the required minimum of 100. It is estimated that this plan would place 25 State Representatives on the Council in the place of the present 9 Representatives from CSPA. Information showing what states would probably be represented and what combinations might be possible is given in Tables 1 and 2.

TABLE 1

STATES ESTIMATED TO HAVE MORE THAN 100 APA MEMBERS BELONGING TO THE STATE ASSOCIATION [a]

California	375	Massachusetts	160	New York	740
Connecticut	110	Michigan	140	Ohio	320
D. C.	180	Minnesota	165	Pennsylvania	210
Illinois	300	Missouri	105	Texas	125
Indiana	100	New Jersey	160	Washington	100

[a] The information on which Table 1 is based is somewhat out of date. Five states do not have affiliated associations at this time, but some of these may qualify soon. The table is offered only to suggest the way in which this plan might operate.

TABLE 2

POSSIBLE COMBINATIONS OF STATES ABLE TO ELECT A SINGLE REPRESENTATIVE [a]

1. Maine, New Hampshire, Vermont, Rhode Island, Ontario
2. Maryland, Delaware
3. Virginia, West Virginia
4. North Carolina, South Carolina
5. Georgia, Florida, Puerto Rico
6. Kentucky, Tennessee
7. Alabama, Louisiana, Arkansas
8. Oregon, Hawaii
9. Iowa, Wisconsin
10. Nebraska, North Dakota, Kansas, Oklahoma
11. Colorado, Arizona, Utah, Idaho, Montana.

[a] See also footnote to Table 1.

b. It is proposed that *the function of the CSPA be merged with the functions of a new Board of Professional Affairs and that CSPA be abolished* in its present corporate form halfway between the state associations and the Council of Representatives.

c. *There would be created a Board of Professional Affairs,* following the general pattern of the Education and Training Board or the Publications Board. The new Board of Professional Affairs would be appointed by Council to be broadly representative of all psychology, including the professional divisions. In its original composition it should include members from the Executive Committee of CSPA.

A number of the present committees of the APA would become committees of the new Board, such as the Committee on Scientific and Professional Ethics and Conduct and the committees on relations with other professional groups. Certain new committees would presumably be added, such as a committee on state legislation.

It would be hoped that this Board of Professional Affairs would relieve the Council of Representatives of some of its preoccupation with these matters and at the same time give the state associations an APA group maximally concerned with rendering assistance to them with their professional problems. The Board of Professional Affairs would at each annual convention organize and hold a conference of state psychological association presidents. This conference would be attended by association presidents or their alternates for the purpose of advising the Board of Professional Affairs regarding those needs of state associations in which the APA can be of assistance. It would also be the respon-

sibility of the Board to facilitate communication among state associations by arranging discussions on common problems.

Let us emphasize as strongly as we can that our intent in proposing these changes is *not* to weaken the state associations but rather to consolidate and simplify the agencies within the APA that have responsibility for working with the states. We believe there is no disagreement between ourselves and the CSPA and the state associations on this point.

The Policy and Planning Board will recommend that the Council of Representatives take action on Item c without the delay and rigidity of a change in the By-Laws. The form of this action is given in Appendix C. Items a and b will require constitutional action. The form of this action is spelled out in Appendix B.

5. The best way in which to bring students in psychology into the circle of the APA has been an unsettled issue for some years. We would now propose a new way in which this might be done, namely, by making it possible for Psi Chi to be affiliated with the APA in an officially recognized manner. Psi Chi is now 28 years old and represents by far the largest organized group at the student level. They are worthy of such recognition as we can give them. Certain changes in the By-Laws would be required—detailed changes are given in Appendix D. The proposal is not intended to be exclusive but, rather, permissive.

In this connection we note that the Council of Representatives proposed last year to take the Committee on Student Activities out of the By-Laws so that the Council may treat this committee as coordinate with other committees created by the Council. It is wise to move in this direction. A similar change for the Committee on Public Relations is a part of the previous item.

6. In the course of our consideration of the professional concerns of the APA, we were constantly reminded that scientific matters were no less deserving of attention. Accordingly the Policy and Planning Board recommends the formation of a Board of Scientific Affairs. We are aware of the recent ill-fated attempt in this direction, but believe that a more modest undertaking may yet succeed. The proposed Board of Scientific Affairs would concern itself with the continued encouragement, development, and promotion of psychology as a science, and with psychology's relations with other scientific bodies.

It is our hope that the Board of Scientific Affairs may find ways and means of upholding the scientific character of APA convention programs, maintain liaison with agencies granting financial support to scientific work, communicate to the membership information concerning availability of grant resources, and maintain liaison with other APA committees whose activities overlap this area. Above all, the Board of Scientific Affairs should address itself to the task of seeking ways in which the resources of the APA can be used in the advancement of psychology as a science.

The Board of Scientific Affairs would either have operating under it, or would take on the duties of, several current committees. We suggest that it be made responsible for the following activities and committees:

The selection of representatives of APA to other scientific bodies (AAAS, NRC, SSRC, Inter-Society Color Council, American Standards Association, Scientific Manpower Commission, International Union of Scientific Psychology)

Selection of recipients of scientific awards

Advisory Committee on the Development and Status of Research and Education in Psychology

Conference on Evolution of Behavior

Precautions in Animal Experimentation

It is the intent of the Policy and Planning Board that the Board of Scientific Affairs may, where possible, actually carry on the work of these current committees itself, rather than serve as a parent body to which the committees report. A detailed recommendation is given in Appendix E.

7. The Policy and Planning Board shares the opinion expressed by several members that it is neither useful nor dignified to conduct a full hearing in a matter of expelling a member for unethical conduct before the entire Council of Representatives. It recommends that provision be made for such a hearing before a Select Committee of the Council. The Board understands that suitable legislation to this end is being drafted by another committee and, therefore, does not submit a detailed proposal at this time.

8. The Policy and Planning Board has re-elected Edwin B. Newman as Chairman for 1957–58.

POLICY AND PLANNING BOARD

CHARLES W. BRAY
LAUNOR F. CARTER
HAROLD M. HILDRETH
DONALD B. LINDSLEY
EDWIN B. NEWMAN, Chairman
VICTOR C. RAIMY
CARL R. ROGERS
FILLMORE H. SANFORD
DELOS D. WICKENS

Appendix A

CHANGES IN BY-LAWS RELATING TO THE PRESIDENT AND CREATING A CHAIRMAN OF THE BOARD OF DIRECTORS

Article VI of the By-Laws shall be amended to read as follows: [1]

1. The Board of Directors shall consist of the President, the President-Elect, [the Past President,] the Recording Secretary, the Treasurer, the Executive Secretary (without vote), all serving ex officio, and six others elected by a preferential ballot by the Council of Representatives from among its own members. Directors not serving ex officio shall serve for staggered terms of three years and their term of service on the Board of Directors may outlast their membership in the Council of Representatives. All members of the Board of Directors shall serve until their successors are elected and qualify.

Article VII of the By-Laws shall be amended to read as follows:

1. The officers of the Association shall be as follows: A President, a President-Elect, [a Past President,] *a Chairman of the Board of Directors,* a Recording Secretary, a Treasurer, and an Executive Secretary. They shall hold office until their successors are elected and qualify.

2. The President shall be a [Fellow] *Member* of the Association . . . During his term of office the President shall [serve as (a) the general presiding officer of the Association, (b) chairman of all meetings of the Council of Representatives, (c) chairman of the Board of Directors.] (*a*) *represent the Association on formal occasions and in such ways as are representative of psychology in the eyes of the public,* (*b*) *serve as honorary chairman of the Council of Representatives and the annual meeting of the Association,* (*c*) *serve as member of the Board of Directors,* (*d*) *deliver, at his pleasure, the Presidential address, and* (*e*) *perform such other duties as he and the Board of Directors shall agree are desirable.* [He shall perform such other duties . . . Board of Directors.]

3. The President-Elect shall be a [Fellow] *Member* of the Association . . . During his term of office as President-Elect he shall serve as [(a)] a member of the Council of Representatives and of the Board of Directors. [and (b) the vice-chairman of the Council of Representatives and of the Board of Directors.] In the event that the President shall not serve out his full term [for any reason], the President-Elect shall succeed to the unexpired remainder thereof and continue through his own term. In the event that the President-Elect shall not be able to serve out his term, both a President and a President-Elect shall be nominated and elected at the time of the next election. The duties of the President-Elect shall be those of a vice-president.

4. [The Past President shall be the most recently retired President and shall serve as a member of the Council of Representatives and of the Board of Directors.] *The Chairman of the Board of Directors shall be elected by the Board from among its own members for a term of one year, and may be re-elected for one additional term. He shall be elected at the regular meeting of the Board just preceding the annual business meeting of the Council, and shall take office at the conclusion of the annual meeting. The President-Elect shall not be eligible for election as Chairman, and the President shall not serve as Chairman during his term in office. The Chairman shall remain as Chairman and as a member of the Board of Directors until his successor has been duly elected and qualified.*

The duties of the Chairman of the Board of Directors shall be (*a*) *to serve as the Chairman of the Board of Directors, and of the Council of Representatives, and as presiding officer of the Association,* (*b*) *to advise the Executive Secretary whenever the latter shall so request, especially with regard to matters of policy and in the interpretation of actions of the Council and Board, and* (*c*) *to be*

[1] In the following material the complete text of each section is given, except where an ellipsis is indicated. The material in square brackets is to be *deleted* from the present By-Laws. The material in italics is *added* by the proposed amendment. The material that is neither in brackets nor italicized is retained unchanged.

the responsible officer of the Association in all matters not specifically delegated in these By-Laws to other officers of the Association.

Appendix B

CHANGES IN BY-LAWS RELATING TO STATE PSYCHOLOGICAL ASSOCIATIONS

Article III of the By-Laws shall be amended to read in part as follows:

2. The Council of Representatives shall be composed of the Division Representatives, Special Representatives, Representatives of [the Conference of] State Psychological Associations and the officers of the Association. In the event there is no Representative of a given Division present, the Council of Representatives will seat one person designated as an Alternate Representative by the officers or executive committee of that Division. The [President of the Association] *Chairman of the Board of Directors* shall preside at the meetings of the Council of Representatives and, in his absence or disability, the President-Elect shall preside. Representatives shall hold office until their successors are elected and qualify.

4. Upon petition of 100 members in good standat the time of the petition's filing with the Recording Secretary, or upon vote of any Division *or State Psychological Association,* any matter of legislation may be brought to the attention of the Council of Representatives, which shall vote upon it at its next regular meeting.

Article XIII of the By-Laws shall be amended as follows:

1. A State Psychological Association may [upon recommendation of the Conference of State Psychological Associations and] upon vote of the Council of Representatives be affiliated with the American Psychological Association, provided that ten or more of its members are members of the American Psychological Association. Continuing membership shall depend upon the State Psychological Association's conforming to [majority actions of the Conference of State Psychological Associations on matters of policy and assessments] *the purposes and stated policies of the Association.* For the purposes of organization, The District of Columbia, the [present] territories [of Alaska and Hawaii], *and commonwealths of the United States,* and the provinces of Canada are to be regarded as the equivalent of states. In areas where there are relatively few psychologists, an organization extending beyond state boundaries may be affiliated, so long as it does not include an area in which there is a state association.

4. [Upon recommendation of the Conference of State Psychological Associations to the Council of Representatives or] In the event that the Council of Representatives believes that the conditions of affiliation are not being fulfilled by a given organization or that its affiliation is no longer in the best interest of the American Psychological Association, the principal officers of the affiliated organization shall be so informed and the affiliation may thereafter be terminated by a two-thirds vote of the Council of Representatives.

[5. There shall be a Conference of State Psychological Associations composed of Delegates who shall be members of the American Psychological Association and who shall be elected by the associations affiliated under these provisions in accordance with procedures established by the Conference. Each state association shall elect one Delegate to the Conference for each 100 members or fraction thereof.]

[6. The Conference of State Psychological Associations shall elect its own Chairman and Secretary. It shall meet at least once a year. A quorum shall consist of at least one official Delegate from each of one-third of the member associations. It shall serve as a medium of integration, mutual help, and exchange of information among State Psychological Associations.]

[7. The Conference of State Psychological Associations shall, by preferential mail ballot, elect Representatives from its own membership to the Council of Representatives for staggered terms of three years. The number of Representatives which the Conference of State Psychological Associations shall have on the Council of Representatives shall be based upon the total number of members of the American Psychological Association who are also members of affiliated State Psychological Associations and shall be determined annually in accordance with the provisions of Article IX, Section 3, for determining the number of Representatives allowed to a Division. No two such Representatives shall be members of the same affiliated State Psychological Association, and so far as possible the

Representatives shall be from different geographical areas.]

5. Each State Psychological Association having 100 or more members who are members of the American Psychological Association shall be entitled to elect a Representative to the Council of Representatives. Such representatives shall be members of the State Association and of the American Psychological Association, and shall be elected for a term of three years by those members of the State Association who are also members of the American Psychological Association. A representative who has served for three years shall not be eligible for immediate re-election.

6. Any group of State Psychological Associations not qualified under the preceding section to elect a Representative may, by mutual agreement, associate themselves in order to elect one Representative, provided that their combined membership includes 100 or more members of the American Psychological Association, and provided further that the terms of their agreement, including provisions for its termination, are set forth in writing to the officers of the American Psychological Association. In all other respects, such joint representatives shall be governed by these By-Laws as if they were representatives of a single State Association.

7. In matters of mutual concern to the state and national associations, it shall be the responsibility of the American Psychological Association to encourage and assist the state associations in taking responsible action, and to formulate when advisable standards of uniform practice that will guide the state associations; and it shall be the responsibility of the state associations to keep the national association and other state associations adequately informed of actions affecting the welfare of psychologists beyond its own state boundaries.

Article XI of the By-Laws shall be amended by deleting Section 8 and renumbering Section 9.

Appendix C

MOTION OF COUNCIL OF REPRESENTATIVES ESTABLISHING A BOARD OF PROFESSIONAL AFFAIRS

The Policy and Planning Board recommends to the Council of Representatives the establishment of a Board of Professional Affairs. This Board shall have general concern for all aspects of psychology as a profession, and shall be charged with the formulation of general policy in professional matters, the establishment of standards of professional practice, the maintenance of satisfactory relations with other professional groups, the fostering of legislation, both state and national, as may be required by the role of psychology in the community, and the supervision and coordination of agencies in the APA whose activities fall within the scope of the Board.

The Board of Professional Affairs shall operate through such committees or other groups as it shall create, or as are placed under its supervision by action of the Board of Directors or Council of Representatives. The Board shall report annually to the Board of Directors and the Council of Representatives on behalf of all agencies under its care, and shall formulate recommendations of actions to be taken by the Board of Directors and the Council in carrying out its general objectives. It shall nominate to the Council of Representatives members of committees placed under its supervision and shall designate the chairmen of these committees. It shall submit such other reports as may be requested of it by the Council of Representatives.

The Board shall consist of nine members elected by the Council of Representatives for staggered terms of three years. The Board shall elect a Chairman from its own members at its last regular meeting before the annual meeting of the Association. The Chairman shall serve for one year unless re-elected.

The initial composition of the Board shall be the Chairmen of the following committees and the Chairman, Chairman-Elect, Secretary-Treasurer, and Chairman of the Policy and Planning Committee of the Conference of State Psychological Associations:

Scientific and Professional Ethics and Conduct
Public Relations
Relation of Psychology to Psychiatry
Mental Health Programs
Academic Freedom and Conditions of Employment

The terms of the initial members of the Board shall be determined by the Board at its initial meeting.

The five committees listed in the previous paragraph plus the committees listed below shall report to the Council of Representatives through the Board of Professional Affairs, except that reports of the Committee on Scientific and Professional Ethics and Conduct required by Article II, Section 10 of the

By-Laws shall be made directly to the Board of Directors:

Ethical Standards of Psychologists
Scientific and Professional Responsibility
Relation between Psychology and Education
Relations with the Social Work Profession
Relations between Psychology and Religion
Relations with American Speech and Hearing Association
The Role of the APA in Mental Health Programs and Research
Joint Committee on Social Science in Public Health
To Consider the Establishment of a Public Information Center for Psychology
Retired Psychologists
Health and Accident Insurance
Professional Liability Insurance

The Board shall nominate to the Board of Directors persons to be representatives to the following organizations, and shall receive and act upon reports of their activities submitted by the representatives:

American Board of Examiners in Professional Psychology
American Board for Psychological Services
World Federation for Mental Health
National Society for Crippled Children and Adults
National Council for Mobilization of Education
Council of National Organizations of the Adult Education Association
Joint Commission on Mental Illness and Health
Groupment Internationale pour la Coordination de la Psychiatrie et des Méthodes Psychologiques

The Board shall organize in connection with the annual meeting workshops or conferences on professional subjects, and shall provide in particular for a conference of representatives of state psychological associations and of state certification boards.

The Board shall propose to the Council from time to time desirable changes in this enabling action and in the agencies and activities in its care.

Appendix D

CHANGES IN BY-LAWS ALLOWING FOR AFFILIATED ORGANIZATIONS

The By-Laws shall be amended by the insertion of a new article as follows: [2]

Article XIV. Affiliation of Other Organizations with the Association.

1. Other organizations whose general purposes fall within the scope of Article I of these By-Laws may become affiliated with the American Psychological Association in accordance with the provisions of this Article.

2. Affiliated organizations shall represent groups of people, such as students of psychology, a substantial proportion of whom are not members of the Association. Such organizations shall not be local in character, nor shall their membership be limited on other than academic, scientific, or professional grounds. It shall be made clear that membership in an affiliated organization does not imply membership in the American Psychological Association, and that the Association assumes no responsibility for the administration or financial affairs of the affiliated organization.

3. An organization desiring affiliation with the American Psychological Association shall petition the Council of Representatives for affiliation, accompanying such petition with a statement of its aims, a copy of its By-Laws, and lists of members and officers. Such a petition shall be examined by the Board of Directors, who will transmit the petition with their recommendation for action to the Council of Representatives.

4. The Council of Representatives shall determine from time to time what privileges of the Association, such as program time at the Annual Convention, subscriptions to journals, and representation on the Council in accordance with Article V of these By-Laws, may be granted to affiliated organizations. Such privileges may be granted in accordance with specific conditions specified by Council.

5. In the event that the Council of Representatives believes that the affiliation of an organization under this Article is no longer in the best interest of the American Psychological Association, the principal officers of that organization shall be so notified, and thereafter the affiliation may be terminated by a two-thirds vote of the members of the Council of Representatives present at a stated meeting.

[2] It is assumed that Article XIV, which previously referred to the Student Journal Group, was deleted by the previous vote relating to membership changes. If not, it should be deleted here.

Appendix E

MOTION OF COUNCIL OF REPRESENTATIVES ESTABLISHING A BOARD OF SCIENTIFIC AFFAIRS

The Policy and Planning Board recommends to the Council of Representatives the establishment of a Board of Scientific Affairs. This Board shall concern itself with the continued encouragement, development, and promotion of psychology as a sci-

ence, and with psychology's relations with other scientific bodies. The Board shall have particular responsibility for the scientific character of the program at the annual convention, for liaison with agencies giving financial support to scientific projects, for awards and honors in recognition of scientific achievement, and for seeking new ways in which the association can assist scientific activities.

The Board of Scientific Affairs may delegate any part of its activities to committees that the Board sets up, and it shall supervise any committees placed under its jurisdiction by the Council of Representatives. It shall report annually to the Board of Directors and the Council of Representatives on matters in its charge.

The Board of Scientific Affairs shall consist of six members elected by the Council of Representatives for staggered terms of three years. The Board shall elect a Chairman from its own members at its last regular meeting before the annual meeting of the Association. The Chairman shall serve for one year unless re-elected. The initial composition of the Board shall be the Chairmen of the Committees on Convention Program Policy, for Selecting the Recipients of Awards for Outstanding Contribution to Scientific Psychology, on Precautions in Animal Experimentation, and the senior delegate to the National Research Council and to the Social Science Research Council, and the President of the American Psychological Foundation. These members shall determine their respective terms of service at the initial meeting of the Board.

The Board shall be responsible for receiving the reports of the following committees and delegates:

Precautions in Animal Experimentation
Psychological Tests
Walter V. Bingham Lecture
Conferences on the Evolution of Behavior
Freedom of Enquiry
Convention Program Policy
Development and Status of Research and Education in Psychology
Selecting the Recipients of Awards for Outstanding Contribution to Scientific Psychology
American Association for the Advancement of Science
National Research Council
Social Science Research Council
Inter-Society Color Council
American Standards Association Committee Z58 on Standardization of Optics
Scientific Manpower Commission

The Board shall transmit to the Board of Directors and the Council of Representatives such recommendations of its committees, or of its own, as shall require action by the Council, or by other agencies of the Association. It shall recommend to the Board of Directors persons for appointment or election as delegates to other scientific organizations, and as members of committees placed in its care. It shall recommend such changes in its own organization, or in the committees placed in its charge, as will make its operations more effective.

THE MINNESOTA CONFERENCE ON ASSOCIATIVE PROCESSES IN VERBAL BEHAVIOR

JAMES J. JENKINS
University of Minnesota

AND

LEO J. POSTMAN
University of California

THE Committee on Linguistics and Psychology of the Social Science Research Council has been sponsoring a series of conferences on specific research areas, research problems, and research methodologies in the psycholinguistic domain.[1] On April 25–26, 1955, a work conference was held at the University of Minnesota to facilitate communication among a small group of research workers who were interested in problems in verbal association. It was hoped that the conference would provide stimulation for the conference members and others to continue their work in verbal behavior, that it would promote an exchange of research techniques, data, and ideas, and that it would lay bare common problems which faced the investigators and disclose areas of needed research. It was also hoped that the conference would provide stimulation and guidance to the Committee on Linguistics and Psychology and that it would help keep the committee informed as to both progress and needs in one of the language-process domains.

The program consisted of seven discussion sessions and a summary session. Each session, chaired by one of the writers of a general paper, began with a 20–30-minute discussion of the material in the paper, followed by a group discussion of specific questions which arose in the course of the research reported, and then went on to general problems or general issues which had been raised. In addition to the conference participants, other members of the Committee on Linguistics and Psychology were present: Charles E. Osgood, University of Illinois; Joseph B. Casagrande, Social Science Research Council; and John B. Carroll, Harvard University. Session chairmen with the titles of their papers were:

Wallace A. Russell. "Bi-directional Effects in Word Association"

James J. Jenkins (with Marjorie Schaefer). "Word Association Phenomena at the Individual Level: A Pair of Case Studies"

Weston A. Bousfield (with D. H. Cohen). "General Review of a Program of Research on Associative Clustering"

Leo J. Postman. "The Analysis of Incidental Learning"

Charles N. Cofer. "Some Problems and Studies in Verbal Behavior"

Davis H. Howes. "Statistical Properties of the Word Association Experiment"

Sol Saporta. "Linguistic Structure as a Factor and as a Measure in Word Association"

Leo Postman chaired a final summary session of the conference. The content of the conference can best be illustrated by the abbreviated paraphrase of his summary which follows.

The similarities and differences evident in the papers and discussion may be reviewed under five headings: comparison of the speakers in terms of their objectives, comparison of methodologies, some differences in conceptualization (that is, in theories or models), the conclusions that may be drawn, and some research needs.

Three types of objectives were emphasized: the definition of basic terms; the measurement of associative repertories; and the assessment of the effect of associative dispositions on learning, perception, and cognition. Saporta's paper and discussion raised very interesting questions as to the psychological definitions of linguistic units. While psychologists ordinarily take these units for granted, it is clear that at some time these questions must be answered, especially if cross cultural work is contemplated. Howes' paper was largely concerned with an elaborated extension of the second objective. The Jenkins and Russell papers involved the latter two objectives, working from normative data to experimental settings. The Bousfield, Cofer, and Postman papers were primarily in the third class since they were concerned with the effects of assumed or manipulated associative dispositions on subsequent performances.

Three main trends appeared in methodologies. The first is the attempt to manipulate or "build in"

[1] The four conferences which have been held at the time of writing dealt with: bilingualism, content analysis, associative processes, and dimensions of meaning. For an extended report of the committee's activities, see *Items*, 1954, **8**, No. 3, 29–34.

associative dispositions in *Ss* and then to observe consequences in cognitive situations of various kinds. Postman provided the major example of this. Second is the inference of associative dispositions from other data (logical classes, lexical classes, etc.) with observation of consequences as before. Bousfield gave the clearest example of such work. Finally, the most pervasive methodology seems to be the correlation of *S*'s behavior with norms. For example, Russell's paper dealt with the effects on a perceptual task of varying associative strength of pairs of words used as stimuli (where strength is determined by norms), and Jenkins' paper dealt with the varying behavior of *Ss* who were congruent or incongruent with the norms.

With reference to differences in conceptualization, the participants seemed to be divided with respect to practically all dimensions. There was a basic division between a statistical, computational, probabilistic, "descriptive" account on one hand (with Howes as its chief proponent) and an explanatory, conceptual, assumed-mechanism kind of approach on the other. Among those who favored assumed-mechanisms, there was the usual split between the S-R emphasis and the "organizational" emphasis (advanced here in the form of a Hebb-type theory proposed by Bousfield). It was not clear just where S-R formulations failed to account for data, but, alternatively, it was not clear that S-R analysis could account for all the data.

Along with the S-R mediation notions came a set of new problems. There was little or no agreement on proposed mediational models (e.g., Osgood vs. Cofer vs. Russell and Jenkins), but it did appear that some models could be treated as variants of others. Some phenomena, particularly the backward linkage discussed by Russell, posed problems for all the mediation models which were only partially answered. Finally, a very widespread problem was uncovered in almost all of the papers: the phenomenon the conference called "priming," "tuning up," or "set." It was clear that some kind of dramatic increase in response strength manifested itself in the data in a variety of situations. Instructions, previous experience, adjacent relevant stimuli can knock the norms into a cocked hat. This was one of the most common problems encountered and was almost completely unresolved. No conceptualization gave an adequate account of this.

There were some conclusions on which the conferees all felt they could agree: The word association technique measures very stable dispositions in *S*. Word association linkages enter as mediating variables or at least as variables in a variety of cognitive tasks. There is some evidence that such dispositions are to some extent manipulable. Word associations may be generally descriptive of what has been called the "cognitive style" of the individual. A simple S-R analysis carries a long way but not all the way—though there was some disagreement here. Sooner or later, some more complex S-R constructs may have to be introduced, or new combining laws may have to be elaborated, or non-S-R approaches will have to be explored.

There was a high frequency of mention of the following research needs: a wider sampling of grammatical categories and types of items in the stabilizing and extending of associative norms; a more careful analysis of the association experiment itself with reference to instructions, special sequences, specific situations, etc.; a study of the limit of modifiability of responses and response sets; extension of the cognitive situations to which the norms are related (e.g., to problem solving); extension of research in individual differences; and the relation of simple associative content to logical and grammatical categories of language.

A more complete account of the conference is available in mimeographed form from the first author.

ELECTRONIC COMPUTERS AND PSYCHOLOGICAL RESEARCH

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ALTHOUGH it is only about ten years since the first high-speed electronic computer was completed, already a number of universities, commercial firms, and governmental agencies have these machines, and many new installations are currently in the planning or the construction stage. Accordingly, it seems not too soon to ask what the effects of electronic computation will be on psychological research.

This paper has the following sections: a brief historical review, a description of the operation of electronic computers, preparation of programs (i.e., machine orders) for computers, advantages and disadvantages of using computers, changes in numerical procedure, the development of new methods, changes in research design. Finally, there is a note of warning about some of the dangers of being able to calculate with less effort. Since my own experience has principally been with Ordvac (Aberdeen Proving Ground) and Illiac (University of Illinois), examples in this paper relate to these two machines. While new programs generally have to be prepared for the different machines because of differences in machine orders, the general principles of electronic computation are sufficiently similar from one installation to another for the Ordvac and Illiac experience to be regarded as typical.

DEVELOPMENT OF ELECTRONIC COMPUTERS

Mathematics and statistics have played an increasingly important part in science during the last 500 years. This quantification of science has not been without disadvantages. The intricacy of the calculations has tended to increase so that the scientist has had to give a larger and larger proportion of his time to the numerical analysis of his results.

Considerably ingenuity has accordingly been displayed in developing computational aids. A fascinating article in the *Encyclopedia Britannica* deals with their development from abacus to slide rule to desk calculator to punched-card machines (20). The latest and most powerful aids are the electronic computers. Their history has been traced back to 1835, when Babbage of the University of Cambridge conceived and designed a mechanical calculating machine, but his device was never completed (5). Interest in the possibility of a very rapid calculating machine revived during the Second World War, and by 1944 the Harvard Mark I computer, a relay machine with moving parts, was ready for use. The first fully electronic machine, the Eniac, built at the University of Pennsylvania for the Army Proving Ground at Aberdeen, Maryland, was completed in 1945. Since then the high-speed computer field has expanded rapidly. In the United States, there must be 100 or more installations in operation at present, and now that their production has been placed on a regular commercial basis, the number is increasing rapidly.

At the same time technical performance has greatly improved. On the Harvard Mark I, a multiplication would take as long as seven seconds, and a division an entire minute. On Eniac, 360 multiplications can be made in a second. Fast modern machines average 1,000 or more multiplications or divisions per second, and even higher speeds are expected in the future.

The first university to make a computer available for general research purposes appears to have been the University of Illinois. The Digital Computer Laboratory was established to provide (*a*) training in the engineering and mathematics basic to electronic computation and (*b*) facilities for extensive calculations by faculty members and graduate students. Two electronic computers have been built on the campus. The first was Ordvac, completed in 1951 for the Aberdeen Proving Ground, and available to university personnel until completion

[1] The work at the University of Illinois reported here has been a cooperative effort involving a number of persons: in particular, K. W. Dickman, J. O. Neuhaus, and R. J. Twery of the Department of Psychology; G. H. Golub and R. T. Gregory of the Digital Computer Laboratory. The work would not have been possible if it had not been for the generous policy of R. E. Meagher, Director of the Digital Computer Laboratory, and of J. P. Nash, Research Professor of Applied Mathematics, of making Illiac freely available to psychologists and social scientists at the University of Illinois.

of the university's own machine, Illiac, the following year. These are two of a group of machines constructed in accordance with a design of Von Neumann, the distinguished mathematician who until his recent death was at the Institute for Advanced Study at Princeton. Computing centers with electronic machines have subsequently been established at various other universities.

OPERATION OF AN ELECTRONIC COMPUTER

For those unfamiliar with computers, a typical Illiac operation will first be described. Data are punched upon teletype tape, a step analogous to preparation of IBM cards. (If data are already recorded on IBM cards, they can be transferred mechanically to tape using the IBM Type 63 card-to-tape machine.) Machine orders for Illiac are punched on another tape. Input of orders and data into Illiac is achieved by running the tapes through a photoelectric reader at the rate of about 200 characters per second.[2] Once input is completed, calculations begin at about 1000 arithmetical operations per second—by an arithmetical operation is meant a completed addition, subtraction, multiplication, or division of binary numbers which are the equivalent of ten-place decimal numbers. As soon as calculations finish, results are punched as decimal numbers on a tape at about 60 characters per second. This completes Illiac use. Results are subsequently printed from the tape by teletype equipment.

TABLE 1

SPEED OF PERFORMANCE ON THE ILLIAC

Arithmetical Operation	Operations per Minute
Addition	650,000
Subtraction	650,000
Multiplication	85,000
Division	75,000
Square Root	2,400
Input and Output of Tape	**Digits per Minute**
Input: Photoelectric Reader	12,000
Output: Teletype (Punched tape)	3,600
Output: Teletype (Printed results)	600
Output: Oscilloscope (Photographic copy)	2,400

Illiac machine speeds are summarized in Table 1. In most current statistical analyses in psychology, computation is so rapid that most of the machine time is needed for input and output of tape. For example, of the 10 minutes or so needed for calculating the intercorrelations of 30 tests for a sample of 500 persons, 90% or more of the time is required for input and output. The correlations are calculated almost instantaneously.

[2] A character refers to a sign, a digit (including certain scaling zeros), or the element of a machine order.

PROGRAMMING FOR AN ELECTRONIC COMPUTER

Just as different methods have been needed for slide rule, desk calculator, and punched-card equipment, so a completely fresh look at calculating techniques is once again required in electronic computation. These changes in computational procedures can be rather well illustrated by considering methods for calculating correlations. (Times have to be regarded as approximations. They vary considerably according to the size of sample, number of digits in the scores, and so on. But even the approximate times given here will indicate the remarkable computational advances of the last 20 years.)

For hand work, squared paper is used for plotting scores. The number of classes is reduced to manageable proportions by grouping scores, although with some loss of accuracy. Some of the additions and multiplications are sufficiently simple to be handled by mental arithmetic, but a slide rule is useful for several lengthier multiplications and divisions and extraction of a square root. After an hour or so, the correlation will be obtained for one pair of tests.

On a desk calculator, the x score for a person is placed on the left-hand side of the register and the y score on the right-hand side. By squaring: x^2, $2xy$, and y^2 are recorded in the upper register, and x and y in the lower. The correlation is calculated from the totals obtained by accumulating these values for successive persons. A correlation can be calculated in about 30 minutes in this way.

On an IBM Tabulator, the operation known as progressive digiting enables products of the x scores to be obtained with a number of other scores simultaneously. If a large set of intercorrelations is needed, 10–20 correlations may be calculated in an hour.

A completely different method has been found the most effective on an electronic computer. All test scores for the first person are input together, and products are calculated and stored. Then the next person's scores are input, and the new products are accumulated with the old. Thus, while conventional methods required us to concentrate upon a

single *test* at a time, forming products for all persons, the electronic computer procedure is to form products for a single *person* for all tests. There is a twofold advantage in this changed order of work: (*a*) any number of persons can be included in the sample despite limited storage capacity, because each person is handled separately; (*b*) test data are generally already recorded in the order required for the electronic computer input. The upshot, as we have seen, is that a correlation matrix for 30 tests —some 435 correlations—can be calculated in about 10 minutes. That is to say, the complete set can be obtained in less time than is needed for a single correlation by the hand method.

Rotation in factor analysis provides another illustration of the changing techniques. While graphical methods are probably as effective as any so long as one is using a desk calculator, they are much less well adapted to an electronic computer, since no precise rule is available for finding the angle of rotation. On a computer, the newer analytic methods of rotation (2, 8, 11, 12, 15, 16, 17) have been found to be much superior.

Desk calculator experience is unfortunately not a reliable guide to the difficulty of preparing a computer program. For example, although the phi coefficient is a simple enough calculation, a computer program proved quite difficult to write. This was because a special system of storage had to be devised utilizing the binary characteristics of the Illiac as fully as possible, thereby enabling many more items to be included in any one analysis.[3] On the other hand, once programs have been written for the basic matrix algebra operations—matrix multiplication, matrix inversion, and the calculation of latent roots and latent vectors—the difficult multivariate calculations, such as canonical analysis (7) and the multiple discriminant function (13), can either be carried out on a step by step basis without any further programming or an integrated program to carry through the entire calculation at once can be prepared relatively easily from the basic programs already available.

Special training is needed for writing programs, and even when a programmer is experienced, several months may be required for preparing a major one. Unfortunately, as much time is sometimes needed for correcting the orders as for the original writing, since errors are rather easily made and can be very difficult to track down. The programmer generally works with limited storage space. For example, the main storage of Illiac consists of only 1024 locations. That is to say, only 1024 numbers and machine orders can be held in the main storage at one time. This is supplemented by 12,800 locations upon a magnetic drum. The programmer tries in planning his program to achieve maximal use of storage space.

Even after programs are in regular use, there are generally many opportunities for improvement: self-checking routines can be written so that the machine checks its own operations at each stage, either stopping or recalculating automatically in the event of any discrepancy; more efficient forms of storage can be developed to enable handling of more data; machine orders can be modified so as to simplify preparation of data and order tapes. The ideal program, in terms of saving labor and machine time, is the integrated one in which a lengthy sequence of calculations is carried out in a single machine run, with such intermediate results printed out as may be required by the investigator and specified to the machine. At present, three separate calculations are required for factor analysis on Illiac. In the first, the correlations are computed. Means, standard deviations, and/or variances and covariances can be obtained in the same operation if required. The second stage is the calculation of principal axes factor loadings (6, 19). The third is the rotation of these loadings by the quartimax or some other analytic method. New teletype tapes are required for each stage at present. The ideal technique will be the combination of these three programs so that the test scores form the input and the output is the rotated factor loadings, along with such intermediate results as are needed by the investigator.

Anyone using an electronic computer should aim at building up a library of basic programs as soon as possible. This is essentially a capital investment. Table 2 lists some of the programs currently available at the University of Illinois. The existing library will be seen to cover many of the standard types of statistical analysis in psychology.

ADVANTAGES AND DISADVANTAGES OF USING COMPUTERS

There are three principal advantages in using electronic computers: rapid computation, less ex-

[3] It might seem at first sight that the general program for product-moment correlation could be used for the calculation of phi coefficients. While this is so, the limited storage space would then be very inefficiently used.

pense, greater accuracy. Little need be said about the first, since the savings in time will be apparent enough from Table 2. This table gives times from the beginning of input of tapes to the end of punching results. Even allowing 10 times or perhaps as much as 20 times as long as this for preparing and

TABLE 2

SELECTED LIST OF PROGRAMS FOR PSYCHOLOGICAL CALCULATIONS ON ILLIAC

Program	Capacity for single machine run	Machine time for capacity run for typical problem (input, calculation, output)	Programmer
A. CORRELATION			
1. Product-moment correlation	38 tests, any number of *S*s	20 min. for a sample of 400	Twery and Golub
2. Phi coefficients, covariances, and chi squares for dichotomous data	100 items, 300 *S*s	70 min.	Dickman
3. Intraserial correlations (autocorrelations)	800 3-digit measures	5 min. for lag of 50	Cohn and Augenstine
4. Multiple correlation	21 independent variables	5 min. for a sample of 100 (input of test scores)	Golub
B. MATRIX OPERATIONS			
1. Matrix multiplication $m^A n^B p$	$m + p = 38$, n unlimited	15 min.	Twery
2. Sums and sums of squares for the rows and columns of a matrix	300 rows by 300 columns	5 min.	Neuhaus
3. Matrix inversion	22 tests	5 min.	Frank
4. Calculation of latent roots and vectors	23 tests (latent roots and vectors), 40 tests (latent roots only)	15 min. for order 23	Gregory and Golub
5. Calculation of multiple discriminant function	17 tests	10 min.	Golub
C. FACTOR ANALYSIS			
1. Rao's canonical method	17 tests	Several hours for complete convergence	Golub
2. Principal axes factor analysis	23 tests (40 tests can be handled by a series of operations)	12 min.	Neuhaus
3. Communalities estimation: principal axes analysis	19 tests	4–5 principal axes iterations (i.e., 30 min.)	Twery
4. Centroid factor analysis	60 tests conveniently (more if necessary)	9 factors in 70 min.	Vreenegoor and Dickman
5. Square root factor analysis	250 tests	3–4 factors in 30 min.	Twery
6. Quartimax orthogonal rotation	745 factor loadings	45 min.	Neuhaus
7. Indices of factorial similarity for two or more sets of factors	38 factors	15 min.	Twery
D. GENERAL			
1. Means, standard deviations, variances and covariances	38 tests, any number of *S*s	15 min. for a sample of 400	Golub
2. Solution of simultaneous equations	39 unknowns	4 min.	Wheeler
3. Linear programming	18 activities, 30 restrictions	15 min.	Isaacson
4. D^2 statistic (Osgood-Cronbach)	30 *S*s, 30 scores	12 min.	Wilson
5. Intercorrelations of paired comparison data	16 paired elements, 350 *S*s	12 elements, 100 *S*s: 20 min.	Stone
6. Roots of a polynomial	300th degree	Roots for 50th degree polynomial in 10 min.	Muller
E. PROGRAMS TO REDUCE CLERICAL LABOR			
1. Matrix transposition	960 elements	5 min.	Twery
2. Ranking of a set of numbers	800 numbers	8 min.	Dickman
3. Generation of random numbers	—	100 3-digit nos. per min.	Augenstine

checking data tapes, printing results by teletype, etc., there are obviously still very great savings in time. It is not exaggerating to say that a job which would take weeks on a desk calculator can be completed in a matter of hours or even minutes with a computer.

The second advantage is cheapness of calculation. This claim may appear incredible since the commercial rental for a high-speed computer may be $200 or more per hour. Indeed, at first sight it seems to be an exceptionally expensive system of computation. But high speed of operation more than offsets high hourly cost. The cost per arithmetical operation on Illiac has been estimated to be only about one-twelth of that for the university punched-card equipment. Admittedly, it may take a while to convince industrialists, university administrators, etc. that any machine operating at a cost of $100 or more per hour is a bargain. But this is indubitably so. Once this is widely realized, rapid expansion of electronic computation is inevitable. The question to be asked by any large-scale research organization will then no longer be, "Can we afford to use a computer?" but "Can we afford not to use one?"

The third advantage lies in the high accuracy of Illiac. Calculations are generally carried out to ten decimal places, so that final results may be obtained which are accurate to as many as eight decimal places. This means that any results published to three or four places will be completely accurate. Contrast this with any long series of desk calculator operations: the psychologist is often faced with the unpalatable choice of (*a*) working to a large number of decimal places, thereby taking an incommensurately long time in his research, or (*b*) working to very few, when rounding errors may accumulate so much that one can no longer have complete confidence in the final results. Furthermore, there are few desk calculator operators who can calculate day after day without occasional small mistakes, even with a rigorous system of checking. An electronic computer, on the other hand, makes errors much more rarely than a human operator; and either by building the necessary checks into the program, by making an overall check of the final results, or by repeating the analysis on the computer, if need be, complete accuracy becomes attainable.

The principal deterrent to using an electronic computer, assuming one is available, lies in the difficulty of writing programs. The PhD student, for example, has to decide whether the time required for learning to program and for writing programs will be more than saved by the reduced time for computation in his investigation. Likewise, the research administrator may be faced with a similar dilemma as to whether he can afford the time to get the necessary programs prepared or would do better to carry on in his familiar, albeit relatively inefficient, way. These tactical problems will diminish as more extensive libraries of programs become available.

A second disadvantage is likely to be more long enduring. Electronic computation makes greater demands upon staff than do more conventional methods. Indeed, the rate of expansion of electronic computation seems likely to be governed less by supply of machines than by that of trained personnel. The effort in becoming familiar with these machines is quite considerable. Sometimes persons who have successfully enough used a desk calculator in routine clerical fashion prove quite inept at the electronic computer level. In desk calculator work, an occasional error is not overly serious, provided calculations are checked at the end of each stage, since any small section can be recalculated without too much delay. With an electronic computer, any error renders valueless an entire set of results. Furthermore, the exact numerical methods practicable on a computer are generally more demanding mathematically than the ones which they supplant. My impression is that those trained in physical sciences generally make a better transition than those trained in social sciences. The ideal man, of course, is the one with training both in mathematics and the physical sciences and in psychology.

CHANGES IN NUMERICAL PROCEDURE

This paper so far has been concerned with the immediate gain from a computer, viz., the ability to carry out customary analyses more rapidly. Quality of research is unchanged, but the job is done less laboriously.

The greater scientific contribution, however, lies in the widened powers of statistical analysis and experimental design. The remainder of this paper will be concerned with some of these changes. The present section deals with the possibilities of examining data more intensively, of using better statistical methods, and of finding out about the arithmetical consequences of our mathematical assumptions.

The two following sections will be concerned with the development of new mathematical models and with changes in research design.

Our present research designs are often governed more by computational than by logical considerations. Consider, for example, the prediction of some complex performance. The industrial or the clinical psychologist often finds himself with a superabundance of data. But since calculation of a multiple correlation with a large number of predictors is a rather arduous undertaking, the investigator frequently excludes the measures which seem to him least promising prior to his regression analysis. Computational considerations have obliged him to make his selection in advance of his results. A computer changes the position. An initial analysis becomes possible which retains the full set of predictors, and any reduction in their number can then be made on the basis of their regression coefficients.

At present, inferior statistical methods often have to be used even when better ones are available because of the labor of the latter. Prediction of job performance may be given as an example. This performance is often highly complex. A doctor may be a credit to his profession, for instance, because of his great skill in diagnosis, or his clever methods of treatment, or his reassuring bedside manner, or his warm humanity towards his patients, or his achievements in scientific research. He is not necessarily equally successful in all these directions. Yet we are customarily content either to select a single one as our criterion or to sum achievements in these different areas in some arbitrary way. These restrictions upon the criterion are imposed for computational convenience. The mathematical theory exists for handling several criteria simultaneously: Hotelling's canonical analysis was presented 20 years ago and Pearson's bi-multiple correlation 30 years before that. These procedures have remained textbook names because of the excessive calculations. An electronic computer enables us to operate with multiple criteria as well as multiple predictors. A canonical analysis with 20 criteria will not take more than an hour. Once the technique has been used more often, we shall be better able to appraise its usefulness. Some preliminary Illiac results suggest that there may be somewhat similar objections to canonical analysis as those which Thurstone urged against unrotated factor analysis, viz., that the axes in the multivariate system should be located with respect to psychological interpretability rather than mathematical convenience. But even if canonical analysis does not prove to be the final word to the predictive problem, it is certainly logically preferable to our present ad hoc ways of handling multiple criteria (18).

We often do not know much about the arithmetical consequences of our algebra or our statistics. Many examples might be given, but discussion here will be restricted to two. First, although estimates of communalities are extensively used in factor analysis, little is known about the best methods of estimation or the differences introduced in results by varying their values. This is where a computer is helpful. Experiments have shown that estimation is often very inaccurate and that convergence can be extremely slow when the new estimates are derived iteratively from prior loadings. Furthermore, the rank of the matrix can be shown to be much larger than generally assumed (that is, there are many more common factors). More positively, the squared multiple correlation of each variable with the others, already proved by Guttman (4) to be a lower bound for the communality, supplies a reasonably good starting point for the iteration. The second example is drawn from the mathematical theory of learning. Bush and Mosteller (1), considering learning as a stochastic process, have developed a mathematical model for rate of learning. The model is in algebraic terms and does not specify the length of time required by an average animal to learn a given response. The number of trials required has been determined empirically, however, by Twery and Bush by using random responses generated by a computer.

DEVELOPMENT OF NEW METHODS

Electronic computation promises to stimulate the development of more realistic and comprehensive mathematical models because of the knowledge that these can be applied without excessive labor. Three examples can be given from recent research at the University of Illinois.

The first is Rao's canonical method (14) of factor analysis. This supplies a more rigorous statistical formulation for the estimation of factor loadings and the testing of significance of factors, along lines somewhat similar to Lawley's maximum like-

lihood method (9). Rao developed his procedure with special reference to convenience of electronic computer operation.

The second is Cattell's technique (3) for rotating factors to "parallel proportional profiles." Cattell has proposed that whenever two sets of loadings are obtained for the same variables, the preferred rotations should be those making the loadings of one solution most nearly proportional to those of the other. His recent solution involves algebraic operations convenient upon a computer but laborious by any other means.

The third example is McQuitty's pattern analytic procedures (10). His methods provide a novel attack upon the time-honored problem of attributing different values to item responses depending upon the patterns in which they occur. Illiac programs have brought these patterning techniques within reach of practice even for extensive sets of data.

CHANGES IN RESEARCH DESIGN

Psychological experimentation was originally based upon the physical science model. For the psychophysicist, all factors were to be held constant save the one to be systematically varied to determine its effects. We now know this view of psychological methodology to be too limited to be tenable. First, it is clear that any psychological "laws" will have to be regarded, at least in the foreseeable future, as statements of probability rather than certainty. (A similar shift to probabilistic statements has occurred even in physics.) Secondly, our theory must take account of the patterning and organization of stimuli—in statistical terms, interactions have to be considered as well as main effects. This tendency for psychology to become both probabilistic and multivariate implies increasing recourse to rather complex methods of analysis. Computers will provide the technical assistance needed for this type of research.

The applied psychologist also stands to benefit. At present, in planning any multivariate investigation—a predictive study or a factor analysis—the number of *Ss* to be tested is customarily arranged at the outset of the investigation. This decision usually represents no more than some a priori conviction. Logically a sequential approach would be better. Once a multiple correlation or a factor analysis can be completed more quickly, it becomes practicable to make an initial analysis for the first 100 *Ss*, let us say. If this analysis indicates deficiencies either in the selection or the construction of tests, the testing program can be revised without too great loss of effort. If the battery seems satisfactory, successive analyses can be made for 200 *Ss*, then 300, and so on, until stability is attained in the results. Computers will thereby make possible a more flexible approach to the testing situation, with the possibility of continuing experimentation for as long as may be needed to provide definitive results.

In summary, computers are probably going to have a marked effect upon the planning as well as the analysis of experiments. The reduced proportion of time devoted to statistical analysis will mean that the design can be governed more by logical and less by computational considerations, that statistical assumptions can be examined instead of taken upon trust, and that methods with adequate mathematical rationale can be adopted in place of ad hoc procedures.

A NOTE OF WARNING

There are, of course, dangers in easier computing. For one thing, it will be very easy to collect more statistical results than one can possibly study or report. This may have happened sometimes with desk calculators and punched-card equipment; it will probably happen more often when electronic computers are the all-too-willing slaves. Calculating may become so easy that numbers may sometimes be collected for their own sake. Probably every person working in quantitative psychology has had inquiries along the following lines: "I have 300 variables. Can you tell me what I should do with them?" or, "I should like to examine every possible combination . . ." Furthermore, the psychologist who punches his tapes and leaves Illiac to do the rest will probably have a very imperfect feel for his data as compared with the one who spends days or even weeks calculating his results.

One can only hope that mathematical knowledge will increase as arithmetical skill declines. It is clear that electronic computers will bring psychologists into greater contact with physicists and applied mathematicians. Perhaps some curb on numerical overexuberance will be provided by the consideration that electronic computer time is usually ra-

tioned rather carefully and is generally under the watchful control of physical scientists who are not always impressed by the present level of quantitative sophistication in psychology and the social sciences.

For the psychologist skilled in investigating quantitative problems, the electronic computer will be a godsend. His computational load will be considerably lightened, exact methods can be used where approximations have had to suffice, less effort need be given to the development of short cuts, and more time will be available for his principal work, the formulation and testing of hypotheses.

There probably will be excesses and wasted effort in the early days of widespread electronic computer work. Yet, in the long term, it seems to me that electronic computers are going to play much the same role for the statistically minded psychologist as the telescope has for the astronomer and the microscope for the biologist: the role of an instrument leading to greatly widened horizons.

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PUBLIC RELATIONS—FOR WHAT?[1]

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PUBLIC relations may seem like a strange subject to discuss with an audience that is oriented toward the scientific side of psychology. Public relations for most of us is a little on the seamy side. It smacks of shoddiness and superficiality. Unfortunately for this view, psychologists are faced today with some problems that are bigger than just their own affairs. These problems lead on into this area of public relations, and we will do well to talk a little about them, whether they are our favorite topic or not. Furthermore, if psychology is to play the constructive role in modern life that many of us hope it will, then it is important that it be understood by the people with whom we must work.

The setting of the problem is revealed by the increasing evidence of hostility to psychology that has appeared in the last few years. This hostility has cropped up often enough now so that it cannot be ignored. We may decide that it is inevitable and is just one of the facts of life with which we must learn to live. Or we may decide on measures to be taken that will ameliorate the hostility. We may believe hostility can be avoided. In any case, we need to look at it somewhat more closely in order to get our thinking straight.

A HOSTILE WORLD

Let me be much more concrete. What are some instances of the hostility I am talking about? Why am I worried about them? As a start, I note that psychology has had some troubles with the medical profession. For some six or eight years now we have grappled with one small crisis after another that has involved conflict between the two professions. Sometimes psychologists have precipitated the crisis by seeking legal recognition in areas that medicine believes to be exclusively its own. Sometimes medical people have touched off the explosion as they seek means of dealing with people they regard as quacks and charlatans. The remedies often overreach the disease. We have seen attempts to extend the definition of the practice of medicine to cover all ailments, mental as well as physical, and the mental covers a lot of ground. Not only psychologists but social workers, probation officers, pastors and priests have felt such definitions went too far.

And in response to each crisis a fire brigade has been sent forth to cool tempers down and to prevent the destruction of important gains made in the interest of human welfare. In 1947 the APA appointed a Committee on the Relation of Psychology to Psychiatry. Four years later there was appointed an Ad Hoc Committee on Relations with the Medical Profession, and the next year (1952) it renamed itself the Ad Hoc Committee on Relations with Other Professions. We also formed an Advisory Committee on Legislative Matters in 1952, prompted in large part by our troubles with licensing. In 1955 we agreed with the American Psychiatric Association to an armistice, a moratorium on legislative action. This came after a series of skirmishes that looked rather threatening. I shall not try to detail these skirmishes. The threats have been real. They have come from the American Medical Association, from past officers of the American Psychiatric Association, and from local medical groups. The crisis in Massachusetts in the Spring of 1956 involved a zealous guardian of the public interests, the District Attorney of Suffolk County, a zealous guardian of the interests of the medical profession, and a number of people woefully lacking in information about psychology and psychologists. The incident served, among other things, to reveal some acute uneasiness among our competitors.

A second area of potential hostility, less visible but quite as explosive, lies in the field of personnel selection. The claim has been made, and there is no reason to doubt its general correctness, that tests can be devised to spot potential trouble makers in a labor force. Men who may become leaders among the workers can be similarly anticipated. Now, if you were the manager of a large and highly competitive business and you believed psychologists could give you such information, what would you

[1] This paper was read in substantially the present form at the Mount Holyoke Intercollegiate Psychology Conference on April 28, 1956.

do? I suspect you might be tempted to employ more of the people who you thought would be docile and satisfied and comfortable to have on your payroll. And if you were a labor leader who believed that psychologists were supplying such information and that, on the basis of the personality tests, potential captains in the defense of labor's rights were being turned away at the gates, what would be your attitude? I would guess that it would hardly be a friendly one.

The recent transplanting of certain clinical techniques to the field of market research has been disquieting, to put the matter mildly. People have felt it was all right for someone to ask them what they eat for breakfast or where they buy their shoes. But when mass Rorschach tests promise to reveal a housewife's anxieties about her family, or psychoanalysts plan our soap operas, or when advertising has been deliberately planned to sensitize you to the fact that the Jones's car is four inches longer than yours, this seems like an invasion of some kind of privacy. People resent it, and they say so. You and I may believe that "motivation research" is in bad taste or is poor psychology, but to conservative people in commercial fields it has a nightmarish quality, and to consumers it seems like an improper manipulation of their private lives.

As psychologists begin to brag of their prowess, news of their claims spreads even more widely; and it has reached legislative halls. In the recent congressional investigation of private philanthropic foundations by the Reece committee, there was a lot of nonsense and silly accusation, but there was also evidence of a very deep-seated distrust of these newfangled medicine men who call themselves social scientists (3). Witness the committee's preoccupation with the Social Science Research Council and its President, Pendleton Herring. Social scientists are people who have access to just the same information that ordinary people—politicians and administrators—do. But the social scientists can take this information, perform certain polysyllabic incantations, and come out with conclusions, couched in authoritative language, that are often at variance with the conclusions of the ordinary man. The result is upsetting and, in some circumstances, fear provoking.

The phenomenon is not at all new. There are important historical parallels in instances in which the public has been extremely antagonistic to a special group of people. In New England we had trouble with what people thought of the "witches" in Salem. In 1834 there was a rather violent anti-Masonic movement in Massachusetts and in New York State. In 1854 the Know-Nothings, acting as a political party, fought the Pope, elected a Governor, and captured the Massachusetts General Court. Perhaps it is unfair to put the Social Science Research Council in a class with Freemasonry and the Catholic Church, but each of the three represents a self-designated elite who claims special knowledge and attempts to exercise, each in its own way, special control. And each, in turn, generated widespread distrust or even belligerent opposition.

Still more recently, psychologists have found themselves on the defensive because of the commendable efforts of some of their number to find out how juries work and to improve the time-honored methods of our courts. The hue and cry that resulted was not entirely spontaneous, nor was it free of political overtones. On the other hand, there was once more a significant undercurrent of uneasiness about a social change that was being manipulated by the employment of expertese. This matter was recently reviewed so excellently by Michael Amrine and Fillmore Sanford (2) that I shall not elaborate on it here.

Finally, and here I am touching on a delicate issue, there has been uneasiness among our humanistic colleagues. Of course, this is a very old conflict, but I believe there is some evidence that it has recently become more articulate. Archibald MacLeish, in an article in *The Atlantic Monthly*, has said (4), and I shall paraphrase a bit freely:

> The exclusive proprietary right of science to know and to communicate knowledge is not only commonly recognized in our civilization, in a very real sense it is our civilization. But the proposition is not one I can accept. The apologists for science are not justified in claiming, nor the apologists for poetry in admitting, the sole right of science to know.

MacLeish characterizes science as knowledge by abstraction:

> Science can abstract ideas about apple from apple and organize these ideas into knowledge about apple. It can then, by some means, introduce that knowledge into our heads—possibly because our heads are abstractions also. It should be possible to *know* the thing *as the thing it is*—to *know* apple *as* apple. This the scientist does not understand; all he knows is a world dissolved by analyzing intellect into abstraction.

At another point MacLeish argues:

> The children of abstraction are wrong and are impoverished by their error, as our entire time is impoverished by it. We begin with one abstraction (something we

think of as ourselves) and a mess of other abstractions (standing for the world), and we arrange and rearrange the counters; but who we are and what we are doing, we simply do not know—above all what we are doing.

I am sure I could have found many other poets and artists equally pained. This example suggests simply that science, and in particular the science of man, is not held in high esteem by all men.

So much for my inventory. As you will see, I have chosen a series of examples ranging from a rather narrow professional conflict to big, philosophical issues. I do not suggest, as a famous western senator has done, that there is a plot or plan in all this. But in the public mind this hostility may very well accumulate until it spells real difficulty for psychologists in accomplishing some proper and worthwhile missions. Rather than look for a plan, I propose that we try to see whether there are any common causes of the growth in hostility towards psychology with the idea that our response to public hostility should be governed by what we know of its causes. The following is one line of thinking that such an analysis might follow.

CAUSES OF HOSTILITY

The first and most obvious thing to say is that psychologists are much more numerous than they once were. If I recall my statistics correctly, the APA grew by a factor of four between the end of World War I and the beginning of World War II, grew roughly from 1,000 to 4,000 members. The APA has also grown by a factor of roughly four between the beginning of World War II and the present, in this period from 4,000 to over 15,000 members. Since I first learned what the word psychologist means, there have emerged 15 times as many of the breed as were then abroad in the land. And if you happen to be a person who feels a little uneasy about a psychologist, this rate of growth can turn your uneasiness into real terror. Not a little of our problem with the medical profession arises from the fact that Clinical Psychology is growing at a rate far greater than Clinical Psychiatry. Moreover, as the Ad Hoc Committee on Relations with the Medical Profession pointed out in May 1952:

> Much of the application of psychology occurs in settings where older, more established professions are already on the scene; in other words, the psychologist applies his own techniques and insights to problems of long standing concern to ministers, lawyers, social workers, educators, administrators, politicians, physicians, engineers, or other professional people (1, p. 145).

The ad hoc committee pointed to certain other consequences of this overlap of functions. In this context I want simply to emphasize that the differential in rates of growth among these professional groups will lead to significant changes in what jobs are done by psychologists and what is left to others. Detailed arrangements will always be fluid in boundary areas, but so long as this rate of growth continues there is going to be pressure, and pressure may lead to trouble.

But it does not seem to me that the picture is accurately drawn simply in terms of a kind of horizontal movement under the pressure of our increasing numbers. There are more fundamental social changes that underlie the intrusion of psychologists into wide areas of human life that they have never touched before. I keep asking myself the simple question: what did our parents and grandparents do when they faced the kinds of problems that lead people today to seek the help of psychologists? How did the world manage for so long without us?

A good friend of mine has argued to me that at one time people didn't do anything about many of these problems, that two generations ago people had less leisure time, that it is expensive to have a neurosis, and that people simply did not indulge themselves in psychotherapy the way many of our contemporaries do. I am sure there is some truth in this. We have made it respectable to be a hypochondriac. But I want to argue that this is not the whole answer. I want to suggest that we have been undergoing very profound changes in the structure of our society and that the emergence of psychology as a profession is part of the social change. The kind of division of labor that characterized the industrial revolution of the 19th century is now taking place in the social revolution of the 20th century. To put it more pointedly, we are working toward the mass production of human happiness.

One evidence for this social transformation is the change that has taken place in the size of the family as a functional unit. In my grandfather's household there were included grandparents and grandchildren and certainly maiden aunts. There were domestic servants, a number of them "living in." This was even more true of the generation before his when the family lived in the country. It made sense to have a house with 10 or 12 or 15 rooms. When there were still not enough rooms, we used trundle beds to pack more people in. Today, in contrast, we cannot find enough one- and two- and three-room apartments to accommodate grandpar-

ents in one part of town, normal adults in the suburbs, and the children somewhere else, often married and off at college. Domestic servants are practically unknown.

Now one of the consequences of this is that important elements of stability and cultural control are gone. Christmas dinner with 25 or 30 aunts and uncles and grandparents and cousins was always an exciting occasion. But it was not only exciting. It was an occasion that also showed me what kind of a person I wanted to be, and I knew that, if I really was like these people, I would belong to something fine and big and secure. To be sure, there is mobility and freedom from restraint in our changed family organization. But at the same time there is insecurity and a lack of ready access to the wisdom that some of the aged can provide. Perhaps I can sum up by saying that hereafter we may look back on the strange time in our history when father figures were fathers in fact.

There are other kinds of change taking place. Certainly one of the spectacular things about the technological developments in the past 30 years has been the tremendous change in communication, not only in terms of the obvious things like radio and television, but quite as much in terms of people's mobility and, hence, whom they meet and talk to, with whom they work and play. It always amazes me when I find people in our laboratory who think nothing of travelling 40 or 50 miles a day to work. Think of the variety of social contacts that this produces. If you go back less than 50 years and try to assess from what other people a man learned social values, you would doubtless be impressed by the overwhelming importance of the primary group: family, as I have suggested above, but also school, church, and immediate neighborhood. These influences are still present, but they are competing with the mass media of communication, and they are diluted by the fact that the effective neighborhood now often encompasses a large sector of a metropolitan area. With this variety in the kinds of contacts he has, a person will find it far more difficult to feel sure about what are the good things for him to do.

I can only spectulate about the changing role of a professional group under the impact of these more fundamental social changes. I am sure, however, that, if we had all the facts, we would find that lawyers and certified public accountants, investment counselors, and funeral directors have all been affected quite as much as have ministers and doctors and psychologists. For one thing, as the influence of primary group relationships has weakened, there is an obvious need for surrogates that are supplied by outside people, and more and more this means by professional people. We turn less to our families, more to the expert outside. As this process goes on, then, there are being created larger professional groups and also new kinds of professions. The curious question is why just this particular group—the psychologists—has increased so tremendously and some other group has increased much less. The comparison across the lines of psychology and medicine and religion leads to some fascinating speculation. But I shall forego that here. I am arguing simply that there is an acute social need as a consequence of social change, and the psychologists are trying to meet that need.

This process of creating a new profession is a very difficult one, and it is not accomplished overnight. Let me mention three difficulties that we face. For one thing, a profession needs people who are the profession, and to be a good profession you need good people. The flow of able people into any professional area depends upon quite complex factors. The choice of a profession is influenced by attitudes of parents, and by the example of teachers and other professional people, and by other factors up to the actual economic incentives offered to the job seeker. Like many of our sister sciences we are very much worried today about this problem of supply. Our success as a profession depends on it.

Second, there needs to be a body of accepted knowledge, a body of knowledge that in some measure supports public acceptance of the profession. I recognize that knowledge is a relative thing and that professional groups have achieved status with very little knowledge to go on. Doubtless the most poorly trained psychologist today knows more than the witch doctor and the medicine man. But this is a poor excuse for stopping with what we know now. We need quite desperately to know much more, and I, for one, feel quite distressed when I see good research-oriented psychologists looking at short-run objectives when there are tremendous long-term needs for research and education.

Finally, there is a very complex problem of control, social control. Any group of people who sets itself up as being specially competent, who exercises responsibility and in turn is afforded important privileges by society, must have some mecha-

nism to make sure that these responsibilities and privileges are carried out in the interest of the public and not to the advantage of the individual. We are grappling with this problem of control when we undertake to set up a code of ethics and ask for legislative sanction. But such formal devices are quite meaningless unless they reflect, on the one hand, a set of social attitudes that are characteristic of the profession and, on the other hand, attitudes possessed by the society that trusts and respects the profession. I suggest that it is quite impossible that these attitudes can be evolved in any short period of time. They will probably take several generations.

OUR PUBLIC RELATIONS JOB

By this time you perhaps wonder what on earth this all has to do with the business of public relations. I am not too sure myself just how it fits in. But the very fact that I introduce these rather general and philosophical considerations here makes the point that I would emphasize. It is: we must see ourselves accurately in the present situation, and then we may go about our job for the future more usefully. The following points carry this argument a bit further.

For one thing, I find myself not much interested in a program of diffuse public information or for the popularization of psychology. There is nothing bad about public information, and anyone who wants to work at the job of scattering seeds of knowledge widely in the population is certainly to be commended. It may well be that such popularization is to be desired, but I am not convinced that a little knowledge of psychology spread widely will alter very much the important forces influencing social change. This parallels the problem faced by the atomic physicist or the organic chemist. The average citizen simply cannot understand these highly technical disciplines, although he has every reason to expect information on the relations of physical science to his daily living. Similarly, the average citizen is not going to understand electroshock therapy or closed-circuit television as a teaching aid because he knows about Freud and afterimages and the effects of reward and punishment. Psychology as an institution, as exemplified by our state and national associations, ought to confine itself to public relations at the level of the policy makers, and not try to become a large-scale educational enterprise. This is my belief.

For a second point, I would argue that the increasing role of psychology in people's lives is pretty inevitable; and the best way that we can help this situation is by making sure that we have a first-rate product to sell, and not worrying too much about selling it. In fact, I am convinced that we do ourselves more harm in certain of our present activities by overselling what we have to offer than by underselling it. The sheer fact that we are training large numbers of psychologists and that, although they are scarce, they are still more available than, let us say, psychiatrists will over and over again put psychologists in positions of responsibility. Let us pray that they are prepared to exercise that responsibility in a good way. Let us not worry too much about the fact that not every similar job is filled by a psychologist, be he good, bad, or indifferent.

Then there are certain consequences of the long way we have to go before we can expect the public to regard us as a prestigeful group. One of these has to do with the question of what kind of public responsibility we take on. How does the profession act in public? What does it do? Among ourselves, and with respect to problems concerning psychologists, we have a lot to say. Thus, it is appropriate that we establish standards of training, that we give competent psychologists a label, and, by inference, that we point to quacks. It is appropriate that a clear role for psychologists should be created in our schools, in correctional institutions, in the treatment of the handicapped or of alcoholics. But when we get into areas where public policy is not clear, where there are differences of opinion among our fellow citizens as to what our country should do, there it seems to me that psychology as an institution should stay out. Heaven knows that we should impose no limit on what the individual psychologist may do. He has every right to write speeches for Adlai Stevenson or to work as an investigator for the McCarthy subcommittee. He may believe that socialized medicine will be the greatest boon that our Federal Government can give the individual worker or that farm subsidy payments will sap individual initiative and result in the moral collapse of the American farmer. But I suggest that, in this period when psychology is growing into a responsible role as a group of people dealing with human affairs, we should not make statements *as a group* on farm subsidies or the Bricker amend-

ment or social medicine or the commercial development of atomic power.

Since this is a delicate point, let me say just a few more words about why I take this position. It is the essence of our democratic system that each person has an equal right to be heard. Different speakers still meet with more or less acceptance, of course, depending upon how persuasive their views may be. But they enter the market place as equal. Now it is the essence of a professional group—of a priesthood, if you will—that it has special knowledge and that its views carry disproportionate weight. We do not publicly rebuke a doctor for his diagnosis nor a lawyer for his professional opinion. Our democratic society makes this exception to its general rule, but it is a limited exception. In return, it expects the professional man not to use this special privilege in areas beyond that in which his competence has been recognized. And the determination of broad public policy does remain in the public domain. Society welcomes us there as wise citizens, but will punish us if we behave like privileged pundits.

I would make this added observation. So long as we are in this business of influencing public policy in any degree, we are going to have to face the fact that the changes taking place will engender a certain amount of hostility on the part of some people. I do not think we should be alarmed about this. But at the same time we should not go out of our way to cultivate hostility. We should recognize it for what it is and try to keep it in reasonable bounds. In some areas, change should be accomplished slowly, with compromise, with patience and confidence in the future, and with all the reason that we can muster. If you are young and impatient, this may look like defeatism, but I should prefer to call it realism.

And now let me make two final points briefly. First of all, I conclude that our positive undertakings in the improvement of public relations should be largely in terms of what key people know about psychology and how they react to us. For one thing, there will be a good deal more give-and-take if we are dealing with people at the professional level and in policy making contexts. There should be this give-and-take. The pattern for psychology of the future should not be formed by psychologists alone. Actually, this problem of reaching doctors and legislators, educators and commissioners is in many respects a more difficult kind of public relations than is an appeal to a large number of listeners or readers through mass media. For one thing, you need to know your facts. The contacts are often individual contacts and, therefore, more time consuming. And what is really hard to live with is the fact that you can show very few obvious or spectacular results. The rank and file within psychology become convinced that nothing is being done.

The other point that I should like to make is that not all psychologists are going to want to get mixed up in the same way in all parts of this problem. There is a good deal of impatience among scientifically inclined people with what they term "mere professional problems." I share with my fellow members of the Division of Experimental Psychology a good deal of this impatience. But in a larger sense there is no fundamental division between knowledge and the use of knowledge. Scientific facts must be communicated. They are applied in gaining other scientific facts. Thus, the use of scientific facts runs a whole gamut from the purest scientific study to the therapeutic interview. So long as we choose to study psychology, it will be impossible to divorce ourselves from the social setting in which psychology lives and is applied in all kinds of human activities.

So far as public relations are concerned, we may not be the best doctors when we are doctoring ourselves, but doctor ourselves we will. By trying to put these problems in a larger framework, I hope that we shall gain a better understanding of them. We need patience and forbearance as they are worked out. We need the help of many people when opportunity offers. We need to be loyal to psychology both for what it means to us who are psychologists and live by it, and for what it will contribute to the society of which we are all a part.

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Comment

Educating Psychology's Underwriters

The development of psychology into a full-fledged complex of professional services while maintaining its roots in its own traditions of research and scientific habits of critical thought is a remarkable achievement. No other profession has grown in quite the same way, and few scientific disciplines have had their capacity for creative and relevant hypothesis making so enriched by professional opportunities. Among the more tangible benefits at least partly attributable to professionalization have been the increased prestige and salaries of psychologists in institutions, the greater availability of research funds, and the enlarged opportunity to work in formerly inaccessible settings.

These advantages, however, entail certain responsibilities if they are to be maintained and if psychologists are to live up to their self-imposed roles as responsible citizens of both the political state and the community of professions. One such responsibility is that of explaining who psychologists are and what they can and cannot do to the publics who support their enterprises. This objective of educating psychology's underwriters actually sums up what is involved in a dignified but energetic public relations program. Far from being a bag of publicity tricks, public relation is, as one psychologist has put it, "simply part of a decent professional way of life."

Conceived in these terms, the foundation of psychology's public relations, of course, is substantive advancement in the field. More meaningful and better executed research and more competent forms of service are the best and indispensable ways of helping the public to become more aware of psychology and psychologists. But just as a scientific finding has not become a part of the science until it has been reported, a new development does not become socially useful until it has been presented and interpreted to an audience that is wider than the group of specialists within which it originated. Consequently, ways of disseminating psychological information must be given explicit attention.

While this problem can probably most wisely be delegated to special groups in national, state, and local organizations, it demands widespread comprehension among psychologists generally and the exercise of some responsibility on the part of individuals acting on their own initiative. For example, psychological topics are being dealt with more and more frequently in popular magazines, in the press, and even on radio and television programs. Sometimes they are presented accurately; sometimes they reflect a startling degree of misunderstanding of psychological facts or principles. One way or the other, they can profitably be responded to in a courteous and friendly way, either commending accuracy or calling the attention of writers, editors, and program directors to psychologists as available experts who can save them from blunders.

The goal, obviously, is not that of forcing a retraction or correction or obtaining "equal time" for rebuttal. Rather, the aim is to establish cordial channels of communication with what E. L. Bernays calls "the natural articulators of society," the people whose daily business it is to produce attitude influencing copy or program material. Through the education of such a key group and through increasing its awareness of the existence of competent psychological advisers and their friendly availability, much can be done to reach a larger public in positive ways. Psychologists need not become public relations men—a probably unattainable and unwise objective; they do need to develop and maintain adequate professional relationships with the moulders of public opinion in order to insure psychology's appropriate representation to those who support it through taxes, tuition charges, research grants, and fees for services.

There are many other ways in which psychologists can function to enlarge public understanding of their profession and their science. By a bit of individual inventiveness, collective responsibility, and the support of formalized public information efforts through the APA and state and local associations, psychology can fulfill its obligation to keep its underwriters informed and at the same time build a public more widely and soundly educated about the behavior of living organisms, including that most fascinating of all protoplasmic blobs, man.

EDWARD JOSEPH SHOBEN, JR.
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Public Relations is Your Business

On the writing of letters to magazines, the advice from the publishing field seems to be in line with B. F. Skinner: one can usefully reinforce "good" behavior, less effectively punish "bad." Letters of respect for an accurate job might well be sent to both editor and writer; letters expressing regrets over a poor job might best be sent to the writer only. But an angry letter to an editor without word to the writer is not likely to lead the latter into ways of righteousness.

The APA Central Office often makes representations to publishers. But correspondence from psychologists

at universities, in business, or at a military establishment, for example, carries as much or more weight than the same thought from an organization which may be regarded (rightly or wrongly) as automatically performing a guild function. The Central Office people concerned suggest that psychologists too often see a poor TV show or magazine article and ask, "Why doesn't someone tell them how mistaken they are?" Such psychologists might well ask, "Why don't I tell them?" In many cases, the true story, well told, would be more interesting to the average reader.

MICHAEL AMRINE
APA Public Information Consultant

MA versus PhD for Psychologists

I have much sympathy for the point of view expressed by Frank O. Volle (*Amer. Psychologist*, 1956, 11, 716–717) regarding the MA degree as fully qualifying for the title and privilege of psychologist. As one who has two masters degrees from separate institutions, I have a healthy respect for this level of training. However, Volle has given the best argument for the PhD inadvertently in his own comment. By suggesting that anyone ought to be able to take the exams qualifying for psychologist, he has voiced exactly the criticism made by those who discredit our profession by saying that "anyone can be a psychologist"—implying that it doesn't take much to be one. The mere passing of an exam would not dispel the odious reputation of a profession which has no educational requirements. The whole question is whether or not the MA or the PhD should be the cut-off point.

At a time when every profession is seeking to assure the public of the adequate training of its members, it would not behoove psychology to lower its standards. Criticism of the PhD program is much more convincing from those who have gone through it. To be honest, before I had a PhD myself, I would have agreed with Volle. Now that I have one, I thoroughly disagree with him. I think that all those who go through the PhD program, no matter how it varies from university to university, will feel that enough has been gained over the MA level training to justify making the PhD the *minimum* acceptable professional level. Our responsibility to the general public requires that we obtain the highest possible training for professional competency. If there is something amiss with our PhD training, I am all for correcting it—but not for doing away with it. I would advise a client to go to a PhD psychologist for psychological help for the same reason that I would advise a patient to go to a person who has at least the MD for medical help. The mind is as arduous a subject as the body, and the understanding of both should take equal time in preparation. Perhaps there are other citizens without the MD degree who could neatly cut out an appendix, but would Volle go to one of these if he required this operation? Let the MA psychologists get their PhDs and thereby join us rather than fight us.

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"Submasteral" Psychologists

The flight patterns of the swallows and the entrails of our sacrifices should apprise the wary that the APA is in for another round on the topic of subdoctoral training. Many are convinced that much work in psychology can be performed without the doctorate. As I do not know what work can be performed outside the hood, I should like, here, only to call attention to the possibility that some and perhaps much work of a psychological nature can be performed by persons at the bachelor's level. Such a solution of psychology's perpetual problem might have many advantages over the conventional solution of a two-year MA program.

If the focus is changed from *subdoctoral* training to a consideration of the *requirements for a technician*, the perplexing question of the role of the MA can be avoided. The issue of the master's degree has hopelessly confused all previous discussions of technician training.

In discussing the proposal that some technicians can be trained at the bachelor's level if current curricula are slightly modified, four objections have frequently been raised:

1. *Undergraduate programs should contain a minimum of psychology and a maximum of cultural and scientific content.* This objection is, of course, the traditional attitude of the liberal arts college in which most psychology departments are budgeted and from which practically all psychologists were graduated. Without denying the significant core in this tradition, one can still include some vocational preparation in the undergraduate curriculum of some students without damage to the education of those young gentlemen who are planning to enter the ministry, law, medicine, or a graduate school. The universities have long accepted the notion of vocational preparation at the undergraduate level; we have well respected colleges of engineering, journalism, education, business, nursing, etc. In addition, we have programs within the liberal arts colleges which truncate the typical four-year program: premedicine requires only three years before entering the professional school, while dentistry requires only two; chemistry is frankly vocational at the undergraduate level, but also requires an admixture of liberal arts subject matter. There is, of course, no reason why an undergraduate program for technical workers in psychology could not combine psychology with other subjects, much as is done at the present time.

2. *Some graduate work is necessary for technical workers in psychology.* This objection is probably based upon our current undergraduate programs and is decidedly at variance with experience in other fields in which responsible persons can be trained with *no* graduate work—consider only: school teachers, engineers, mathematicians, editors, bacteriologists, chemists, accountants, bank presidents, senators, and presidents of the United States.

3. *Students with bachelor's degrees are too young for positions requiring technical skills.* Although this statement may be true for highly skilled technical work, there seems to be little point in keeping students on ice for several years in expensive refrigerators because a few positions demand experience and maturity. Besides, beginning salaries for most non-PhDs are not out of line with the age reached when the bachelor's degree is awarded. Interestingly enough, no one has yet suggested that seniors are unable to learn the necessary content.

4. *Few schools could afford a parallel psychology program for technical workers at the bachelor's level.* If separate curricula were necessary, this objection would carry much weight. If, however, students were offered a combination of fundamental courses during the undergraduate years, most of them could learn higher level skills on the job. Few if any employers require complete mastery of skills at the time of employment. (Vide our PhDs!) Furthermore, although a few specialized courses would be highly desirable, it would probably be unwise to try to prepare super-technicians who would be completely competent at the time of graduation, as this cannot be done even in a two-year MA program. Finally, technician training would probably include most of the courses now required for the bachelor's degree.

Turning to the disadvantages of training technical workers in graduate schools: the most serious problem arises from the fact that the PhD is generally coming to be accepted as a definition of a psychologist, even in fields such as college teaching and industrial psychology. The problem is similar to that found in medicine and law, where no one can function as a physician or lawyer without the appropriate degree, regardless of his actual knowledge and skills. In psychology, the erection of this arbitrary barrier is reaching such proportions that one can begin to question the wisdom of preparing any persons at the MA level if they seek a career in psychology and expect to have family responsibilities. There are few career pathways for persons without the PhD, regardless of the number of lower level jobs open for non-PhDs at the present time. Although this statement may be exaggerated somewhat as far as present conditions are concerned, one wonders what the situation will be in 1965 and 1970 when our current MAs will reach full maturity. (I am not forgetting that jobs exist outside of psychology, but these occur as the result of chance rather than preparation. Persons with the bachelor's degree could fill most of them as readily as those with master's degrees.)

Allied to the problem raised when the PhD serves as an arbitrary barrier in the career pathway are the problems which occur due to the status and salary expectations of the person who has just completed two years of graduate work. Society implies that status and income shall be roughly proportional to the amount of formal education. A two-year MA, from one point of view, represents only *half* of the time spent in graduate work for the PhD. But from another point of view, the two-year MA represents *six years* of collegiate preparation versus only eight years for the PhD. The owner of the MA cannot be blamed for regarding himself on his first job as almost-a-PhD and expecting status and salary which are almost those of the PhD. And after five years of experience, what should the MA expect? This problem cannot be solved entirely by training technicians at the bachelor's level, but the obvious inequity could be greatly reduced.

The final disadvantage of tying the technician to graduate work is found in the basic supposition of this comment that a moderate curricular change at the undergraduate level will prepare technicians with almost the same level of skill and will save them and the universities two very expensive years in graduate school.

VICTOR RAIMY
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Bakan and Behaviorism

In Bakan's article, "Clinical Psychology and Logic" (*Amer. Psychologist*, 1956, **11**, 655–662), that part of his argument which leads him to conclude that the method of science may not be relevant to the study of human behavior, in addition to containing certain errors of reasoning, seems to me to reflect an essential misunderstanding of what is meant by the method of science.

Initially creating a straw man by defining behaviorism as "that position in the field of psychology which denies the possibility of a psychology of experience on the grounds of the privacy of experience"—a strangely narrow, artificially limited, and ad hoc definition which I strongly doubt would be espoused in its present form by any current advocate of a behaviorist approach to psychology—Bakan then proceeds to commit a more serious blunder by setting up a spurious equation between behaviorism (as he defines it) and the method of science. Having established this patently false equation, Bakan then proceeds to reject his unique version of behaviorism as theoretically barren, and as an immediate consequence of this rejection of one half of his equation, he next proceeds unjustifiably to reject the other half of his unbalanced equation arguing erroneously against the relevance of the scientific approach to the study of

human behavior. Moreover, in further criticism of what he takes to be the behaviorist position, he identifies a "perplexing antinomy" which he believes characterizes the behaviorist orientation in psychology in which the "pragmatic argument: *That the behaviorist position will lead more quickly and more surely to the satisfaction of the criteria of prediction and control of behavior*" is counterpoised by "an atmosphere which is contemptuous of problems associated with the prediction and control of human behavior." Again, I strongly doubt that the latter half of this "antinomy," as herein presented, can be claimed justifiably to characterize the position of any currently active behavior theorist. With respect to the first half of this antinomy, the claims of the behaviorists as to the fruitfulness of their theoretical approach to the problems of psychology can be evaluated fairly only on an empirical basis, i.e., how much verifiable and useful data is derived from their approach to the field of psychology.

Returning to Bakan's argument against the relevance of the scientific approach to problems of human behavior: in addition to rejecting the method of science solely on the untenable basis of its fallacious equation with what he takes to be the behaviorist position in psychology, Bakan adduces as evidence in further support of his criticism certain observations made by Tolman, Rogers, and Hebb regarding the methods they employ in arriving at what they hope to be fruitful hypotheses in their respective areas of endeavor.

This evidence is, of course, entirely irrelevant to the issue of the applicability of the scientific method to psychology. The method of science does not prescribe, proscribe, or in any way legislate the procedure to be adopted in arriving at a fruitful hypothesis. The question of the procedure whereby a promising hypothesis is discovered or formulated is one that properly belongs in the realm of the psychology of creative thinking and certainly bears no direct relevance to scientific method per se. All that the method of science requires is that, once an hypothesis has been formulated, it be of such a nature that it allows for the deduction of consequences (theorems) that can be communicated to and objectively (empirically) verified by others competent to do a job of verification. If Hebb and Tolman can derive such hypotheses by pretending to be rats and if Rogers believes he can predict and control a patient's behavior by intuitively placing himself within the patient's phenomenological field, more power to them! I, for one, consider them no less "scientific" for adopting their unique approaches to the formulation of fruitful hypotheses—though I may doubt the effectiveness of their procedures as contrasted with the procedures employed by other investigators in the field. Certainly nothing they do—or publicly say they do—can, in my view, call into question the validity, the applicability, or the relevance of the method of science (as I understand it) to the field of psychology.

MYRON BRENDER
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The Logic of Clinical Psychology

Bakan makes the point lucidly (*Amer. Psychologist*, 1956, **11**, 655–662) that the ailments of clinical psychology do not flow from a lack of logic but from a lack of appropriate method. The logic is there; what is the method which fits it? However, he defines the logical problem in a way I would dispute.

The logical problem of clinical psychology, Bakan says, is "the making of inferences about experiences from overt behavior." That is, the clinician infers the patient's thoughts, feelings, etc. In my opinion, a logical model based on this definition will leave the psychologist without means of verifying his inferences. Or, at least, he will be without means of verifying them quickly and simply. This difficulty of verifying is not only a scientific defect but a professional defect; if one lacks a criterion of accuracy, he has no way to improve in competence.

An alternative, better model would redefine the problem of the clinician. I propose that the clinician's problem is not the inference of experience but the inference of subsequent behavior. The probabilities involved in such a model—let's call it the "neobehavioristic model"—are concerned with the use of observations of overt behavior by the clinician to infer subsequently occurring overt behavior. According to this model, I understand patient or client if: I can anticipate what he may be leading up to by his discourse, what he will say at the end of a long silence, and what his maneuvers will be during a phase of resistance. One can determine the truth or falsity of these anticipations.

The neobehavioristic model may seem to prevent me from following into the remote distance some of the trains of fantasy and association within the patient. One is, however, free to examine such trains of association; the proviso is that they will eventually prove productive, i.e., lead back to a greater comprehension of the patient's behavior in the social realm.

One's choice between Bakan's model and some other model depends upon what he conceives the essence of personality to be. I believe that the essence of personality—the thing we seek to explain and comprehend when we analyze or treat a patient—is the expression of a person in social form, that is, in terms of understandable behavior. Bakan's experience-logic would be preferable if we considered the essence of personality to be fantasy, ideation, and feeling of a private type.

Bakan's postulate of "epistemological loneliness" fits

his model, therefore, better than it fits the neobehavioristic model described here. The latter model is focussed upon a less lonely realm of phenomena than those which concern Bakan. Bakan's personality events are subjective and need to be inferred from observation; personality events conceived as overt behavior are tangible enough to be seen by you and by me, together.

These two types of logic are opposed, not so much in the hypotheses about personality which can be associated with each, as in the general trend of development of clinical psychology which would flow from each. A clinical psychology founded upon the logic of social behavior would create a different atmosphere, set of attitudes, and relations to patients than the currently fashionable, fantastic clinical psychology, which appears to fit Bakan's model. Nor would this alternative clinical psychology create the pseudoscientifically cold atmosphere so aptly ridiculed by Bakan.

Such a new clinical psychology would take soberly the implications of such evidence as that compiled by Meehl in his *Clinical vs. Statistical Prediction.* In contrast to this feature of the neobehavioristic model, that it can accommodate and react to evidence, Bakan's model appears to be silent.

CHARLES A. DAILEY
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"Geographical Center" of Psychology

Among the items of information which give us a better grasp of the nature of the field of psychology is the geographical distribution of psychologists. Leafing through the geographical section of the *APA Directory,* one is impressed by the pages and pages of names for some states, and one wonders whether the more populous parts of the country have a disproportionate part of our psychologists. The following "study" offers some crude information on these topics.

The number of psychologists in each of the 48 states and the District of Columbia was estimated by measuring the number of inches of names in the geographical section of the 1955 *APA Directory.* These 49 "masses" were located either in the center of the given state or (on a subjective basis) placed at some more likely position (such as the southeast corner of New York State) on a small mercator projection map of the U. S. An arbitrary cartesian coordinate system was superimposed on the map, and a two-dimensional centroid or mean was determined. This centroid might be called the "psychological center" of the U. S. analogous to the "population center." Whereas the population center lies somewhere in Illinois, the psychological center fell about twenty miles north of Indianapolis.

No pretense of precision in the accuracy for the location of this psychological center is made. The estimates of number of psychologists per state could be improved, the location of psychologists within each state could be improved, and the U. S. is not flat as the method assumes.

The 49 political divisions were also ranked according to the estimated number of psychologists and the total population (1950 census). A Spearman rank-order correlation of .84 was found indicating a substantial relationship between how heavily populated a state is and the number of its psychologists. From New York and California, which rank 1 and 2 in both matters, to Nevada and Wyoming, which rank 48 and 49 in psychologists, 49 and 48 in population, no unexpected discrepancies arise. The District of Columbia, Connecticut, and Kansas lead in having more than their share of psychologists (by a rank-difference criterion); Mississippi, South Carolina, and Alabama lead in having less than their share of psychologists.

The location of the "psychological center" might be a basis for choosing convention sites, making Chicago, Detroit, St. Louis, and Cincinnati likely spots. And finally, a speculative reader might care to draw some social implications about the discrepancies between population and psychological rankings of the states.

CORWIN A. BENNETT
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Replicability as a Publication Criterion

From time to time various suggestions have been made on how to reduce publication lag. It has been pointed out that raising the methodological standards by which articles are judged would help solve the lag problem and, at the same time, increase the quality of published articles.

One particular methodological criterion which might help the present publication lag to disappear is that of replicability—requiring every author to satisfy the editor that his major results have been repeated before the article is considered for publication. An extension of this criterion would be to use it to determine, in part, publication priority. Replicability and generalizability, of course, are not new criteria, and assuredly all editors employ them now in judging the soundness of an article. The only novelty here is the weight which would be placed on the question of whether the results are replicable. Every author would be asked to show some attempt in this direction. Articles using replication designs which are not satisfactory to the editor could be given lowest publication priority. Articles with no attempt at replication would be rejected.

Other criteria, such as appropriateness of statistical analysis, controls, whether the conclusion actually follows from the data, etc., certainly cannot be disregarded. However, it is well-known that replicability tends to include many other criteria. If results can be repeated, it hardly matters, for example, that an inefficient method of statistical analysis was used. On the other hand, replicability is a *sine qua non*.

In general, there are always many factors (such as size of room, time of day, temperature, kind of food eaten by *S*, etc.) that an experimenter explicitly states, or implicitly believes, to be irrelevant to the results. Our confidence in a study will be a positive monotonic function of the extent to which replication designs are used which vary these supposedly irrelevant factors.

There are still other factors, such as sex, age, education, etc., that are nearly always suspect. If the experimenter decides to vary these systematically and study their effect, he is generally not concerned with replicability in the sense used by R. A. Fisher. That is, he is not interested in efficient estimates of sampling error, but in the strength of the interaction terms: treatment × experimenter, treatment × sex, treatment × age, etc. (Generalization could be arbitrarily defined as those cases where the interaction terms are insignificant. There is a borderline area where replicability and generalizability seem to merge.)

Although replication designs vary enormously, from the simple "crossvalidation" technique used by the test constructor to the cross-cultural studies done by some social psychologists, there does not seem to be much difficulty in agreeing on a rank-order of merit. What does seem to require a great deal of experience in particular areas is the decision on what level of replicability is adequate. For some psychophysical studies, apparently one or two *S*s constitute a satisfactory replication sample. Some social psychology experiments seem to need not only considerably more *S*s in a replication but also several experimenters before one can reject the idea that the results are simply a function of the experimenters' personality. Probably no one level can be set for all areas of psychology. However, this is exactly that kind of judgment which editors are most qualified to make.

Of course, there will be many studies to which the criteria of replicability and generalizability do not apply: case reports, studies of historical events, tests of a priori hypotheses deduced from theory, etc. And there will always be cases where the significance of an experiment will seem to the editor to outweigh questions of methodological soundness. But these are decisions which have always had to be made (cf., *J. abnorm. soc. Psychol.*, 1950, **51**, 359–361).

There is good reason to anticipate that use of the repeatability criterion might do more than simply increase rejections and reduce publication lag. It seems likely that, under such a built-in reward system, more studies would be designed with replication in mind, the quality of replication (and generalization) designs would improve, and a great deal of overelaborate statistical analysis will disappear. Most of us are convinced of the efficacy of reinforcement as against exhortation in producing desirable behavior.

ARDIE LUBIN
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The Social Sciences and the Economic Order

It goes practically without saying that the economic is one of the more important determinants in our society. From the standpoint of the economics involved, the social sciences and the physical sciences are playing the game from a different set of rules. It is here contended the present short end of the score of the social sciences reflects a handicap resulting from this. The physical and natural sciences deal more with the tangible, the material, the concrete. The social sciences are concerned with the intangible, the nonmaterial, the abstract. Ideas that can be translated into a material product can be more readily protected and consequently lend themselves to capitalization. Innumerable instances abound where inventors and producers have made vast profits through the manufacture and sale of patented material products.

Ideas that can not be translated into tangible form are difficult to capitalize upon. For example, a new concept in the way of parent–child relationships which would promote better mental health is difficult if not impossible for the originator to protect. This idea once exposed can be passed on from person to person, broadcast by radio and TV, published in papers and magazines and thus become common knowledge and a social practice. An infinite number of people could benefit from this concept without appreciable profit to the inventor. Many of the developments of psychology are of this type.

Socially acceptable practices involving the promotion of material products furthers the advantage of the physical and natural sciences. Insult is added to injury. All manner of publicising and various kinds of psychological techniques are used. Full page advertisements are devised to capture attention at a glance, develop attitudes, and supply motivation with a minimum expenditure of effort from the reader. Equally effective techniques are utilized by radio and TV. All of this advances the sale and general use of material products. Many of these products are represented as the development of "science," the result of "scientific" re-

search. Since, to the public, "science" is thus associated with tangible products, it has come to mean the physical sciences essentially. The physical sciences, in effect, are widely publicized. All of this is consistent with the fact that the major part of our economy is concerned with the production and distribution of material goods. According to figures from *Statistical Abstracts* for 1952, two-thirds of our working population are associated with these occupations. This is a quite conservative calculation. A more exact determination could show figures well above this. The development of the physical sciences is consequently seen as directly related to the advancement of the economy. The social sciences are not considered as contributing to economic productivity.

The manner in which new concepts and new ideas in the social sciences are presented to the public contrasts with that of the physical sciences. Typically there is no glamour of advertising, there is little appeal to emotion, there is no sex appeal used. Picture and color are not used. Rather, the chief reliance is on verbal exposition in the form of books. Compared to the effectiveness of advertising in promoting the acceptance of new developments, the results are almost nil. Reading is a laborious, time consuming process. As a consequence of the manner in which new developments are presented, there is an enormous difference in the readiness with which new ideas are accepted by the public.

As has been pointed out, the odds are much in favor of the products of the physical and natural sciences. Does this not constitute one of our very serious social problems: the effect on our culture of some kinds of ideas gaining ready acceptance while others are not, although they may be of equal social worth? Is there not as much evidence for considering our social problems—such as delinquency, mental health, and labor management problems—the result of the underconsumption of the products of the social sciences as of the lack of development in the social sciences?

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Significant Contributors to Psychological Science

Because the excellent APA report on *America's Psychologists* is certain to be studied and quoted for many years, it seems desirable to note an ambiguity in Table 2 on page 62.

A previous chapter has established the representativeness of a sample of 150 as "Significant Contributors" to psychology. These were all drawn—properly for the purpose—from the years 1930 to 1944. In Table 2, we have a listing of the universities producing (would not "emitting" be a better term?) the largest numbers of these Significant Contributors. That gives us, I think, one significant index of the quality of these universities.

Alongside of this listing, however, is a column headed: "Number of Significant Contributors on Current Staff." This column is misleading as an index of the contemporary excellence of the university. An institution with many Significant Contributors from the era *preceding* 1930 might well have relatively fewer of the younger group. In one department there are six senior members of the staff all of whom would undoubtedly have qualified as Significant Contributors had their age group been included in the tabulation. The rank order of that university in respect to Significant Contributors on the staff might well be quite different if the whole population had been reported.

I am not challenging the committee's sampling procedure nor the legitimacy of listing the universities where Significant Contributors (of the 1930–1944 era) tend to congregate. I am suggesting that the heading inadvertently opens the way to a misleading deduction.

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System and Metasystem

In the 100 years since Helmholtz, psychology has become scientific. We now talk about "empirical referents," "intervening variables," and "functional relationships." With some justification we pride ourselves upon our experimental sophistication and insist, in principle, at least, on exploring only "meaningful questions." All of this is welcome evidence of developing maturity. But there is the possibility that some aspects of psychological theorizing are being emphasized to the detriment of other and equally important aspects.

In its early years, psychology was riddled with abstruse metaphysical pseudoproblems. The reaction to this was to declare psychology's independence from philosophy, to exorcise the lingering metaphysical ghosts, and to place our faith in the "observables." However, in this necessary effort to "tie constructs down at the data level," something may have been lost. It is no longer fashionable to explicitly state one's philosophical assumptions or to be concerned with building a metasystem. Perhaps this lack of attention to the philosophical underpinnings of our models partly explains why we are faced with such a confusing conglomeration of theories, and why our journals bulge with articles of no discernible theoretical importance.

Philosophy and science are inseparable insofar as we consider the task of science to be the ordering of data to a model. The making of a model requires that we make certain basic assumptions, that we take a philo-

sophical position with respect to the phenomena we are attempting to order. Ignoring the fact that such assumptions are made and that a position is taken does not clarify the basic issues involved but only serves to obscure and confuse them. Psychological theorists are rightly concerned that their constructs should be testable and reducible to empirical referents. But like a well-behaved intervening variable, it seems important that our models should be securely fastened at *both* ends.

It does not make good sense to insist on the operational validity (however necessary) of the constructs we use if we leave one end of the construct flapping in the epistemological breeze. Operational validity is no measure of logical validity. If we are to avoid ad hoc theorizing, the entire postulate set must follow in a logically consistent manner from explicit basic assumptions. A theory which is so derived may be criticized on the basis that the basic assumption is inconsistent with the observed facts or through a demonstration of logical inconsistencies in the derivation of the postulate set.

In our fear of the metaphysical, we have neglected the metasystematic aspects of our model making. It might be argued that it is not necessary to state the basic assumptions underlying a theory and to go through the formal process of making derivations, that these things are self-evident. That such is not the case is demonstrated by the charges and countercharges which fly back and forth over theoretical issues. "Krumb's articles implies that . . ." says the critic, going on to show that Krumb's thesis is obvious nonsense: to which Krumb replies, ". . . if the writer had taken the trouble to examine the statements, he would have seen that what was *meant* . . ." The point is that if a theoretical position is clearly stated and logically developed, much of this sort of argumentation may be avoided. A system may be legitimately criticized only *as a system*.

The lack of careful and complete development of our models may be responsible in part for the current publication crisis. What has happened to the carefully derived experiment which goes back to the basic assumptions and makes a test of a major hypothesis? Much experimentation seems to be either ad hoc or an exercise in experimental design.

To be sure, our journals are pressed for space, and the process of stating assumptions and making derivations from them takes more space. But perhaps if we asked ourselves, "What basic theoretical proposition does this experiment test?" we would not only ease the space shortage but make a definite contribution toward the advancement of psychology as a science. It might also be that an examination at the metasystem level of some of the current "controversial issues" would expose some more meaningless questions.

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The Joy Buzzer in Experimentation

When psychologists left their ivy covered colleges and universities to invade the work-a-day world of technology en masse, they were faced with a multitude of new, unusual, and immediate problems. With such problems facing him, the applied experimental psychologist often found that the standard pieces of apparatus which one finds in the psychology department supply room were neither adequate nor applicable. For this reason, he resorted to a number of practical field expedients.

We wish to describe one such novel piece of psychological apparatus recently used in a human factors study relating to the evaluation of a weapons system. It is done with the intent of smoking out others who may have devised useful pieces of instrumentation but fear that the lack of sophistication or glitter of their apparatus might bring forth the wrath and censure of their colleagues.

In the course of a research project investigating the effectiveness of camouflage techniques for a certain land mine, the Human Engineering Unit of Picatinny Arsenal was faced with the problem of devising some means for indicating when *S* had stepped on one of the many camouflaged mines strewn along a path. Simply observing *S*'s movements was not feasible since the experimenter would also have difficulty in locating all of the mines. Secondly, for the purposes of the experiment, *S* was not supposed to be aware that the path he was following had been mined, and, consequently, the experimenter could not accompany *S* along the path.

To solve the problem, several members of the unit sat around a table and "brainstormed." A number of elaborate schemes involving electromechanical devices were advanced. However, such methods would have proved too time consuming and expensive and, thus, had to be discarded. The solution, finally hit upon, involved the use of one of the practical jokester's favorite gadgets: the hand buzzer or, as one manufacturer calls the item, the joy buzzer.

This small mechanical device consists of a spring which, when wound, cocks a projecting pin. When pressure is applied to the pin, the spring unwinds and causes a gear to engage a spring metal component that vibrates producing the buzzing sound. The buzzer was housed in a small wooden box containing a hinged resonant metal cover. This arrangement made the buzzer very sensitive, with only a slight pressure on the cover being required to activate it. In setting up the experimental

mine field, the buzzer and housing units were partially buried in the ground, and a camouflaged mine was placed over each signal device. When *S* stepped on a mine, the buzzer gave an auditory signal which could be heard for about 50 feet.

The use of this novel piece of apparatus proved most successful for the problem under investigation. No doubt, there are many similar applications for the use of the joy buzzer in the field of applied psychology. It is hoped that other novel pieces of instrumentation will be similarly revealed for use in psychological experimentation.

JOSEPH L. SEMINARA
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"Tests" in Russia?

In the February 1957 issue of the Bulletin of the (French) National Institute for the Study of Work and for Vocational Guidance appeared a short paper (3) by a member of the Moscow Academy of Pedagogy which contains a few sentences which suggest that psychological tests may possibly again be used in Russia. The passage reads (in translation) as follows:

> The method of "tests" pretends to allow an exact and objective diagnosis and even a prediction. One knows that, as a group, Soviet psychologists do not favor the method. Nevertheless, there are variations in their attitudes (the note by Fraisse (1) is quite correct in this regard). *They are not opposed to short tasks [épreuves] furnishing quantitative results,* but on condition that one has an understanding of their psychological foundations. Similarly regarding statistics, it would be absurd to deny its importance. But the primary task today is to improve experimental methods. Factor analysis which takes a lot of effort has furnished up to now only meager results because it starts from hypotheses which are not very clear cut. Blind methods cannot become farseeing by the addition of mathematical statistics.

The author then continues to indicate that his laboratory is working on human individual differences in the area of conditioning and adaptation (unconditioned stimulus: light; conditioned stimulus: sound) as well as of fatigue (ergograph method) in an effort to apply Pavlovian concepts.

In the same issue, Piéron (2) states that the 20th Congress of the Communist Party of the U. S. S. R. has re-established an official vocational guidance service, in which psychology is expected to participate actively. Psychophysical differences, i.e., special aptitudes and skills, are to be considered in such guidance.

It does not seem farfetched to expect that methods comparable to tests (but possibly named differently) will be developed to determine such aptitudes. It will be interesting to watch further developments.

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Psychology in Action

Editor's Note: The purpose of this new department in the *American Psychologist* is to describe the occupational activities of psychologists in the various specialties of the field, with emphasis on new and significant developments or trends in research or applied activities. It is hoped that the descriptions of the scientific and professional efforts of psychologists will stimulate further developments in the areas discussed and will be of value to other psychologists with similar occupational interests.

Manuscripts submitted to this department will be processed in the same manner as contributed articles in other parts of the journal. It is expected that some editorial revision of manuscripts may sometimes be necessary to adapt contributed articles to the purposes of this department. Submitted articles should not exceed eight manuscript pages. Potential contributors to this department may feel, on occasion, that description of their activities might be construed as institutional advertisement and personal aggrandizement or might describe activities with which the majority of the readership are already familiar. However, if the manuscript describes *psychology* in action, our editorial consultants will be pleased to advise.

THE SYSTEM DEVELOPMENT CORPORATION AND SYSTEM TRAINING [1]

IN 1951, The RAND Corporation, an independent, nonprofit research organization in Santa Monica, California, established a laboratory to conduct an interdisciplinary investigation of human factors in man-machine systems. From 1951 to 1954, a number of studies were conducted at RAND investigating this problem as it related to an Air Defense Direction Center (radar site), a system that not only processes incoming information, but also makes crucial decisions based on interpretations of it. (A somewhat simplified schematic diagram of such a system is shown in Fig. 1.)

Since results of these studies have been reported elsewhere,[2] only one important aspect will be mentioned here: how, on the basis of hypotheses generated and tested in the laboratory, it was possible to make some rather detailed predictions about system learning. The Air Defense Command was convinced by the experimental results that these new techniques might provide a valuable training tool. Accordingly, the System Training Program (STP) was inaugurated and installed in a single Air Defense Division for a field trial. As the result of this field appraisal, it was decided to install the program throughout the Air Defense Command on a long-term basis.

Subsequently, acceptance and expansion of the program led to the formation of the System Development Division within The RAND Corporation. In the expectation of further diversification of these activities, the personnel and facilities now making up the System Development Division are being reconstituted as a separate nonprofit corporation to be known as the System Development Corporation (SDC).[3] For the present, the new corporation will be concerned primarily with the tasks now under way: continued implementation of STP and programming of the computing machines that are the heart of tomorrow's air defense system. In the future, SDC will be in a position to perform research, development, and implementation services for military and nonmilitary uses alike in the field of man-machine systems, simulation, computer programming, and other aspects of automation. The corporation's present activity with respect to STP is described below, together with a brief commentary on other activities with respect to the computer-centered SAGE air defense system.

Just as a well trained individual is one who can adjust his mode of response to specific task stimuli, so a well trained system is one that can adapt to changing demands placed upon it. It is training for this flexibility of operation that is the major goal of STP. The basic strategies for accomplishing this objective are briefly considered below.

In order to maximize transfer of training, STP creates a training task environment that will produce a system response as nearly identical to that of the normal operating task environment as possible. For the same reason, the training takes place in the crew's normal operating environment and uses normal operating equipment. In addition, since learning is facilitated by knowledge of

[1] This article was prepared by W. Richard Goodwin.

[2] In a series of papers presented at the 1955 APA Convention (RAND Papers P-657 through P-662) and in other publications of The RAND Corporation.

[3] While the transfer of activities to this new corporation was not an accomplished fact at the time of writing, it should be achieved by the time of publication; hence, further reference herein will assume that the operations described are responsibilities of SDC.

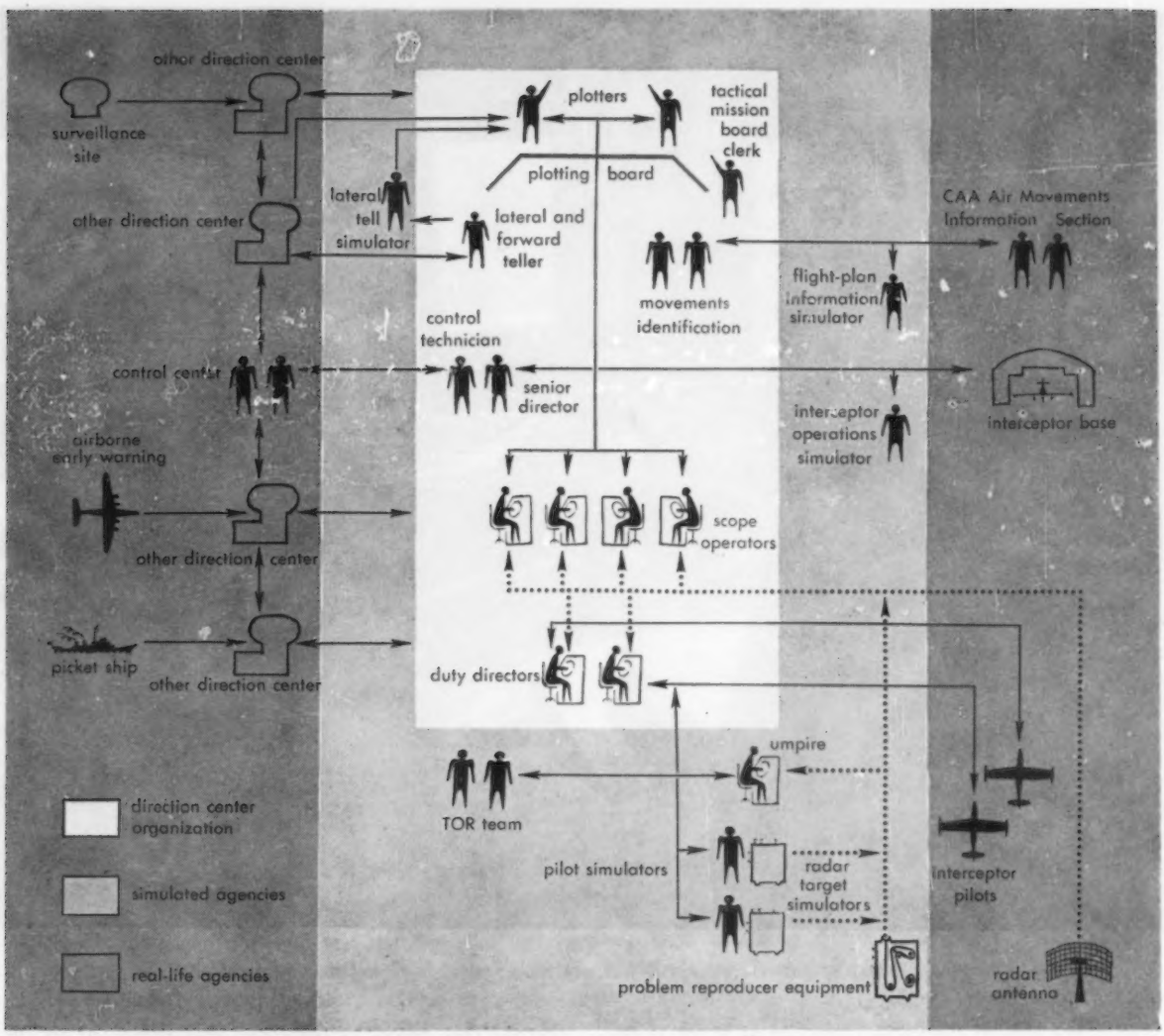

FIG. 1. Although the System Training Program never uses as a training unit anything less extensive than an entire air division, air defense functions can be shown more clearly in a single direction center (the white area above). An average air division contains ten of these radar sites. Flights picked up by radar become blips on radar scopes. Scope operators distinguish series of successive blips as "tracks" and "tell" track positions at regular intervals to plotters behind a transparent board (see Fig. 2). Plotters show on the board each track's course, speed, altitude, and identifying number. The identification section classifies tracks as "friendly" or "unknown" by comparing them with flight plans filed by pilots. Unknown tracks (those without matching flight plans) are investigated by interceptor aircraft guided by radio instructions from "duty directors" who follow both interceptor and target on radar scopes.

The dark areas, right and left, show some of the information inputs to a direction center and some of the agencies it works with. Other inputs, such as airborne early warning aircraft and picket ships, are shown feeding information to other direction centers. The lighter gray area shows how the STP team (and equipment) simulates certain external functions and acts as observer-recorders during STP exercises. Problem reproducer equipment furnishes realistic but synthetic radar blips presenting an integrated picture to all sites in the division. Flight-plan information is read in from a prepared script. If a site normally exchanges information with one in another division, STP requires a "lateral-tell" simulator to provide this input during exercises. Another team member "scrambles" interceptors according to the senior director's orders. Others, playing pilots' roles, use radar target simulator equipment to move synthetic interceptor blips on the site's radar scopes in accordance with instructions from the duty directors. An umpire tells the pilots whether the interceptors completed their missions. A TOR (Training Operations Report) team at each site and another at Division Headquarters observes the entire exercise and records crew actions so that knowledge of exercise results can be given to the crew. This entire operation is performed simultaneously at all sites in an air division, thereby making use of their normal equipment and lines of intercommunication.

FIG. 2. The System Development Corporation's Indoctrination Direction Center.

results, the men in the system are told as much as possible about the nature of this response. And finally, to develop problem solving attitudes and techniques, an opportunity is provided for the men in the system to evaluate these responses and to implement various behavior changes that might improve the overall operation.

More specifically, STP provides training exercises that substitute for the system's normal information inputs. These STP inputs are sufficiently controlled so as to allow detailed and accurate recording of the system response, thereby providing the means for feedback of performance details to the system.

The importance of feedback and group discussion in STP cannot be overemphasized. During an exercise, a team of trained military observers at each site keeps a record of crew responses and correlates them with the known stimulus inputs. This material, called the Training Operations Report (TOR), consists of an objective and comprehensive statement of what stimuli were present during the exercise and how the crew responded to them. This report is presented and explained to the crew's senior officer, who then uses it as the basis for the group discussion which he conducts.

A major reason for these group discussions, or debriefings as they are called, is that during the operation of any extensive man-machine system there exists little opportunity for communication of the kind needed to solve operational problems. The debriefing provides this opportunity, being essentially a problem solving session in which system members can contrast exercise results with system goals. The immediate debriefing objective is to make decisions about ways to cope with any areas of difficulty that were encountered. Those decisions that receive general group acceptance are operationally tested during subsequent exercises and re-evaluated during the discussions which follow.

At present, the basic STP training unit is an air division, consisting on the average of ten radar sites plus various command agencies. Exercises are constructed so as to present an integrated "air picture" to this en-

tire unit and to utilize the same communication and interaction network that exists for normal operations. However, some notion of the flexibility of STP may be gained from the fact that the training unit might just as well be a force, consisting of several divisions, or even an entire command. In other words, this is *system* training, and it is adaptable to whatever size training unit seems most desirable.

Since realism of simulated inputs is crucial to the success of STP, immense quantities of data about air defense operation in the field must be collected. These data vary from site to site, and many different sources are drawn upon. They must provide not only the information needed to simulate normal peacetime operations, but also detailed intelligence information about the nature of potential air threats in order that emergency situations can also be simulated.

Once these data have been processed, it is possible to design realistic training exercises. The design process is an extremely complex one, not only because of the quantities of data involved, but also because the exercises differ from one another in both degree and kind of task difficulty. However, once the design has been specified, production is accomplished by means of a high speed electronic computer which individually computes the position of as many as 2,400,000 separate stimuli for a single division exercise, and does so fairly quickly.

After the training materials for a particular division have been produced, the system members, both the operations personnel and the special STP team members, must be taught how to use them. Considering the size of the Air Defense Command and the fact that this is a field program, it is apparent that the major portion of indoctrination must take place at the sites themselves. To assist in this indoctrination, certain key personnel from each site in a division first come to SDC for preliminary training in the theory and techniques of STP. Then, during the actual field installation, these personnel are in a position to assist SDC training specialists in indoctrination of the remaining system members.

Following installation of the program in an air division, SDC provides the Division Headquarters with a continuing consulting service, each air division having one or two permanently assigned SDC training specialists (usually psychologists) to give support in the administration of STP. These men also provide the military with training in specialized skills required by STP, such as group discussion and problem solving techniques. And in addition, the training specialists provide analyses of how STP exercises are affecting ongoing, air defense operations.

SDC now employs well over 150 professional staff members in the training area, a number that will increase during the next few years. Although this staff includes a number of sociologists, anthropologists, geographers, mathematicians, and engineers, the majority, by far, of those working on the training program are psychologists. The training jobs demand a wide range of psychological skills. For example, psychologists with a knowledge of the problem solving process are needed, not only to design exercises, but also to work on the means for achieving maximum learning benefits from the debriefing sessions. Social psychologists who are experts in the field of small-group behavior contribute to bettering debriefing techniques. Ongoing research activities require persons trained in experimental methodology and statistics to evaluate, not only research relevant to program improvement, but also the progress of STP in accomplishing its training mission. Indoctrination activities require the services of educational psychologists. Still another important and highly specialized role in STP is that of the psychologists with a mathematical background who can formulate the logic of computer programs.

This brief sketch gives some idea of the various psychological skills important to STP. In addition, a substantial number of psychologists are employed on a comparatively recent SDC project: that of adapting STP to the new SAGE air defense system. SAGE is a man-machine system that processes radar data by means of one of the world's largest, high speed, digital computers. While it is in one sense only an extension of the present mode of air defense, the increased scope of SAGE, with not only more but also more complex machines, has made it apparent that system training is essential if anything approaching the full potential of "computerized" air defense is to be realized.

Although there is every reason to believe that the principles of STP apply equally well to any man-machine system, the detailed content of a training program must necessarily reflect the characteristics peculiar to a specific system. In SAGE, this means that extensive study of the system is necessary to determine the precise interrelationship that obtains between its parts. Thus, during the development of SAGE STP, SDC psychologists must take under consideration the greatly expanded continuum of man-machine interactions that is characteristic of an "automated" system. To accomplish this effectively, experts from diversified fields must be consulted. For example, numerous computer programmers are being utilized in the development of SAGE STP. And, once SAGE is installed, SDC programmers will be called upon to adapt and revise the Master Computer Program for active air defense as well as for STP. In fact, this latter requirement alone will shortly demand the output of some 600 persons, approximately one-third of the total personnel of SDC.

There is a growing realization among the individuals concerned with these problems that what may well be a new area of psychological endeavor is emerging from this work. All the characteristics of this "field," if such it is, are not yet known; however, it is apparent that the rapid growth of automation techniques presents a real challenge for psychologists, guaranteeing a most exciting future for those who care to meet it.

REHABILITATION OF THE INSTITUTIONALIZED MENTALLY RETARDED

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AND

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THE use of psychology in institutions, according to available literature, saw its inception at the Training School at Vineland, New Jersey. Here in 1908, the research laboratory, under the leadership of Henry Goddard, started to experiment with the Binet test. In 1916, a complete translation of Binet-Simon's work was published under the title, *The Development of Intelligence in Children*. The adaptation of their test in the United States introduced psychological services into institutions for mentally retarded. The function of psychology, in the beginning, was primarily testing to classify the institutionalized population into idiots, imbeciles, and morons. Later the services were expanded to include clinical, educational, and research activities. As late as 1953, it was still reported (1) that "the role of the Psychology Department in a school for mentally retarded is rather an ambiguous one."

In order to determine the present status of psychology in state institutions, a questionnaire was sent to 101 institutions in the United States and Canada. The questionnaire contained three questions:

1. Do you have a Psychology Department in your institution?
2. If yes, how many members?
3. What is the role and function of psychology in the program of the institution?

This questionnaire was purposely left unstructured so that the institutions would have as free a hand as possible in formulating their answers.

Replies were received from 72% of the total sent. Thirteen reported that they have no psychologists. The remainder were grouped arbitrarily into seven geographical divisions to see if there were trends within different regions. The distributions are shown in Table 1. In Table 2, the reported functions of the departments of psychology are listed in order of frequency.

The ratio of psychologists to patients, with the exception of the Coast states, seems to be similar from region to region. The 72 institutions which replied have 109,010 patients served by 143 full-time and 14 part-time psychologists—approximately 725 patients per psychologist. Also, as will be noted in Table 2, the ratio does not affect the planned functions of the psychology departments.

We divided intelligence testing from projective and diagnostic testing because some departments indicated that they do only intelligence testing while others indicated that they also test for possible psychosis or brain damage. We have lumped all departments which participate in outpatient clinics under one heading—though the services which they provide vary slightly from department to department, with the major emphasis being on intelligence testing. In general, while some departments are involved with extraneous duties, inconsistent with the functions of a psychologist, all are, in varying degrees, doing the same thing. There are some regional patterns to be noted, particularly the growth of the "team" function in the North Central and Great Lakes region, but this is not yet well enough developed to be properly called a trend.

The aforegoing would seem to indicate that much of the ambiguity of which Fox and Sloan (1) spoke has been clarified. However, with the rapidly changing philosophy of rehabilitating the mentally retarded, a question has to be raised: Quo vadis, psychology in state institutions? Or, in other words, how are those functions being utilized in a modern rehabilitation program?

There are approximately 30 different definitions of

TABLE 1

DISTRIBUTION OF PSYCHOLOGISTS IN STATE INSTITUTIONS FOR THE MENTALLY RETARDED

Region	No. of State Institutions for Mentally Retarded	No. of Replies to Questionnaire	Total No. of Patients[a]	Total No. of Patients in Replying Institutions	Total No. of Psychologists		No. of Patients per Psychologist[b]
					Full Time	Part Time	
Coast (Calif., Wash., Ore.)	6	5	11,018	9,545	24		398
Mountain (Utah, Wyo., Colo., Ariz., N. Mex., Mont., Idaho)	8	3	3,919	1,760	2	1	704
South Central (Kans., Okla., Mo., Texas, Ark.)	12	10	12,952	10,402	11	1	905
South (La., Ky., Tenn., Miss., Ga., Ala., N. C., S. C., Va., Md.)	14	10	17,211	13,124	20	3	610
North Central, Great Lakes (Wis., Ill., Ind., Mich., Ohio, Neb., N. D., S. D., Iowa, Minn.)	23	17	40,618	30,836	39	1	780
East (Del., N. J., Penn., N. Y., Me., Vt., Mass., Conn., N. H., R. I.)	29	21	46,837	37,635	40	6	875
Canada	9	6	7,041	5,708	7	2	714
Total	101	72	139,596	109,010	143	14	725

[a] From 1954 *Directory* of American Association on Mental Deficiency.

[b] Based on data from replying institutions only.

TABLE 2

FUNCTIONS OF PSYCHOLOGY DEPARTMENTS IN STATE INSTITUTIONS FOR THE MENTALLY RETARDED

Function	Region							
	Coast	Mountain	South Central	South	N. Central, Great Lakes	East	Canada	Total
Intelligence Testing	5	3	9	6	12	17	6	58
Counseling and Guidance	4	1	3	3	9	9	3	32
Case Conferences	3	1	2	3	8	14	1	32
Projective and Diagnostic Testing	3	1	2	2	8	13	1	30
Inservice Training	3		4	2	6	8	3	26
Psychotherapy	3		3	3	5	6	1	21
Research	2		2	3	6	6		19
Outpatient Clinic			2		5	6	2	15
Achievement Testing	1		1	1	2	7	2	14
Program Planning in Team	2			3	7	2		14
Functions Unrelated to Psychology		1	1	1	2	5	1	11
Public Education	1		2	1	4	2		10
Employee Testing			5		3		1	9
Aptitude Testing				1	3	3	1	8
Social Case Work	2				1	1	2	6
Vocational Rehabilitation					2	2		4

rehabilitation in professional literature. At Muscatatuck State School, a modification of those which are considered best suited to the particular conditions that prevail is as follows:

> Rehabilitation is a continuous process which utilizes all services working as a team to help an individual with physical, mental, and social disabilities and handicaps to raise the level of his physical, mental, and social efficiency.

This definition is based on the hypothesis that human learning is a continuous process from birth to death only interrupted by physical, mental, and/or social barriers which can be manipulated or removed. In other words, human learning has no ceiling, and it is only the barriers which block further learning.

Rehabilitation thus conceived does not indicate the customary "helping the individual to develop to his maximum capacity." This concentration on the individual's "capacity" or "potentialities" brought about many misunderstandings. Therefore, it was decided to take the retardate as he is found, and instead of gearing him toward his maximum capacity, which cannot be determined, helping him to raise his current "physical, mental, and social efficiency."

In the effort to achieve these goals, each department, section, and service must act as a full fledged partner with the other departments, sections, and services of the institution. No department, section, or service can work in an autonomous manner on single aspects of the patient's needs—e.g., medical department only treating a broken bone, psychology department only giving psychometrics, etc.—but rather all departments, sections, and services must work as a team to treat the whole patient. The idea that one service is major and the rest merely auxiliary must be abolished. Catch-as-catch-can methods of working with patients must be abandoned. Thus an interdisciplinary team approach toward diagnosis, program planning, and constant evaluation must be introduced in the rehabilitation of all patients. This concept has so changed Muscatatuck that it cannot any longer really be thought of as a state school, nor can it be thought of as a hospital for mentally retarded. It is, in fact, a rehabilitation center.

Therefore, the question of the role of a psychology department in state institutions ceases to be one of "what does the psychologist do?" (because our survey indicates a strong similarity of functions in all parts of the country) but rather one of "how are these functions being used in the total rehabilitation program?"

A positive example of this can be drawn from the Nursery Program at Muscatatuck: starting with the premise that a test reported merely the particular level of efficiency at which the patient was performing at the time of the test, the whole testing program was reorganized and geared toward learning what the patient could do, what the patient needed in the way of special help, and what, if any, were the underlying problems of adjustment (personality). A survey was instituted to discover the type of patient actually found in the Nursery. All other departments were advised as to the specific results, and the Psychology Department in conjunction with these other departments worked out specific plans: e.g., the initiation of individual programs on a prescription basis, in conjunction with the Medical Department, to speed the development of the child both mentally and physically.

It is felt that the role of a department of psychology in a state institution for the mentally retarded should best be defined as:

1. Maintaining a full fledged partnership with the medical, social service, colony (cottage) life, business administration, and rehabilitation (education, training, and adjunctive services) departments in the total program planning of the institution.
2. Being an integral part of the diagnosis, the program planning, and the follow-up in the rehabilitative processes of all patients.
3. Centering the special skills, training, and experience of the psychologist in those areas where he can be of greatest service to the rehabilitation of the patient.
4. Initiating and/or cooperating in special areas of research aimed at finding better ways of raising the patients' physical, mental, and social efficiency.
5. Serving as part of the team in interpreting to interns, employees, parents, and to the public in general various aspects of mental retardation with all associated handicaps and disabilities.
6. Participating in various other activities not incompatible with the functions of the psychologist.

Thus, the role of the department of psychology, as with other services in an institution, should not be as an autonomous unit with separate function, but as an integral part of a patient-centered team.

REFERENCE

1. FOX, W. W., & SLOAN, W. The function of the psychology department in a school for the mentally retarded. *Amer. J. ment. Defic.*, 1953, **58**, No. 2.

SOCIAL PSYCHOLOGY ON TELEVISION: EXPERIMENTAL PROGRAMMING [1]

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SINCE the beginnings of operations of the nation's first educational television station, KUHT-TV (Very High Frequency), at the University of Houston in June 1953, the writer has had an opportunity to participate extensively in educational television as a researcher and as an instructor of psychology telecourses.

One of the intriguing aspects of educational television deals with the possibilities for experimentation in program content since, unlike the situation which usually prevails in commercial television, no demands for immediate mass audiences are present. When the officials of KUHT-TV provided an opportunity to present a series of psychology programs of a non-telecourse variety on the station, it was perceived as an opportunity to investigate some of the experimental possibilities inherent in the presentation of social psychological content on television. This paper describes certain aspects of the series: techniques of presentation, the presentation of potentially controversial subject matter, and the problems involved in evaluation of the series.

First, let us consider techniques of presentation. On the basis of earlier evaluations of presentation techniques of psychology programs on television, it was decided to emphasize a particular pattern of presentation for the first several weeks of the series. This consists of the liberal use of role playing to dramatize ideas presented, an informal delivery from behind a desk, and occasional movements to a drawing pad upon which ideas can be graphically underlined.

A role played scene is introduced in a "cold" opening. That is, without any identification of the program, the viewer at home, promptly at a specified time, witnesses a scene which is usually presented with dramatic gusto. For example, one evening when the problem of social prejudice was to be discussed, the role players depicted a scene in which one character seemed to display mounting hatred of another character who "wore big knots in his ties." Specific stereotyped expressions of prejudice were included in the scene.

Such a scene is followed by a standard identification from the announcer's booth and appropriate "flip" cards. The camera then finds the lecturer who calls the viewers' attention back to the initial scene, and the topic of the evening is introduced and discussed. Often successive points are further dramatized by role played scenes. At the end of the program, a series of provocative questions are sometimes brought to the attention of the audience. Questions and comments from the audience are solicited by the announcer at the close of the program. Occasionally, a telephone line is thrown open while the program is on the air, and the lecturer attempts to answer whatever questions are called in, as time allows.

The "cold" opening idea appears to be an effective attention getter. On one occasion when the program was to feature a discussion of basic propaganda techniques (just prior to the November elections), the opening scene depicted a "political candidate" fervently begging for the voters' support for a political office (which remained unnamed). Five basic propaganda techniques were deliberately and obviously introduced into the "speech" by the "candidate." Half a dozen responses from different viewers indicated that they had really taken the "candidate" seriously and were surprised to find that propaganda techniques were so obviously (at least after they were called to their attention) being demonstrated.

On another occasion, the topic for the evening was to deal with factors involved in high and low morale in groups. The "cold" opening consisted of two very unhappy workers complaining about management and in the process conspicuously illustrating four basic determinants of low morale. The three-minute sequence had hardly ended (actually before the program was identified) when the telephone of the station rang. On the other end of the line was an irate viewer who wanted to know when those two "communist workers" would be "kicked the —— off TV." So convinced was the caller that the two role players were authentic workers, that attempts at reassuring explanations on the part of the station official who answered the phone met with failure.

Now let us consider the problem of potentially controversial subject matter. The possibility of presenting material in the field of psychology as a whole that may be interpreted as controversial by viewers must be considered. In social psychology, this could be a particularly provocative problem. In the present series, virtually all major problem areas in social psychology, including potentially controversial areas such as minority group prejudice and public opinion and propaganda, have been discussed. These areas were presented with the objective but comprehensive analyses which charac-

[1] This paper was presented at the Southwestern Psychological Association meeting in Dallas, Texas, March 1956, as part of the "Psychology and Television" symposium.

terize textbook or classroom discussions, although vastly simplified in form. Again, as has been the case with previous series of the writer, no evidence of concern or resistance on the part of viewers with respect to potentially controversial areas has been forthcoming. Even though the present series was clearly not a telecourse, academic or scientific objectivity utilized in the presentation of ideas appears to be a valuable asset of the psychologist in his presentations on television, even outside of the province of telecourses.

Finally, let us consider the problem of evaluation. Of course, the most crucial consideration in examining television series, such as the one discussed in the present paper, is evaluation. How many people watch? Are there any significant effects on attitudes of viewers? What can be done to improve the effectiveness of such series? These are among the typical questions that must be seriously investigated. Viewer surveys to date have revealed that psychology presentations on television have entered from between 8,000 to 30,000 homes in the greater Houston area. Although at this time no rigorous audience survey has as yet been made of the audience size of the present series, spontaneous mail, phone calls, and "on the street" response have been very encouraging. Without any prepublicity of any sort, a program was devoted to the social psychological meaning of the intense interest in the Bridey Murphy story. The "cold" opening for this program featured a mock hypnotic session demonstrating age regression. Shortly after the lecturer began the discussion, a telephone line was opened for questions from viewers. Although the request for questions was only presented during a short period, the one line was constantly busy with the calls from viewers. In view of the lack of any advance publicity concerning the nature of the program, this response was regarded by station officials as evidence of a sizable audience.

The entire problem of evaluating the effect of such a series on the attitudes of viewers is of such complexity, in the writer's opinion, that laboratory studies designed to yield the significant variables involved in such viewing behavior would have to precede meaningful field studies. However, one possibility does emerge from such programming and its continuation. This may be referred to as a "clearing the air" function. It is altogether possible that even sensitive attitudinal measures would reveal no immediate, dramatic, direct effects on the attitudes of viewers. However, the fact that such ideas are being openly presented on television and become part of the accepted prevailing social climate may be in itself significant. This may "clear the air" so that tolerant "sets" toward such ideas may eventually develop in viewers, and the possibilities of significant attitude changes or development would increase.

In the efforts to continually utilize such programming for experimentation with content and techniques, cues for the direction of such experimentation usually come from the writer, the producer, or casual comments of viewers. More systematic evaluations by viewers which may provide further bases for experimentation will be forthcoming when Select Viewer Panel Questionnaires are, in the near future,[2] distributed to a representative sample of viewers for comprehensive evaluation of the program.

It may be stated that the present series of experimental programming of social psychology on television provides further evidence which suggests that educational television not only supplies a challenging experimental medium in social psychology, but also in the process provides a means of communicating significant psychological ideas to a greater representation of the population than has heretofore ever been possible.

[2] Made possible by a grant-in-aid of the Educational Television and Radio Center for a research project dealing with an evaluation of the social psychological impact of educational television. This study, *An Analysis of Some Demographic and Psychological Characteristics of an Educational Television Audience,* now completed by the writer of the present paper, is being distributed by the Educational Television and Radio Center, Ann Arbor, Michigan on request.

A PRACTICUM TRAINING PROGRAM

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IT is the purpose of this paper to describe the development of a state hospital practicum program. Although the hospital involved is not a typical state hospital, the development of its practicum program has presented certain problems which would be common to many state hospitals.

The Southeast Louisiana Hospital from its inception was planned as a facility which would offer unique op-

portunities in training and research for its professional personnel. To this end, the psychiatric, medical, and psychological personnel of the two principal medical schools collaborated with the idea of conceiving an appropriate facility. The physical plant includes laboratories for research in psychology, physiology, pathology, biochemistry, and neurosurgery. Within this unit, there are also facilities for housing patients who are participating in investigations. In addition to psychiatric and psychological personnel, who function in service and research areas, the staff also includes basic scientists in chemistry, physiology, pharmacology, and histology. The hospital is affiliated for training with Louisiana State and Tulane Universities, with many of the staff holding teaching appointments in the graduate and medical faculties. The clinical psychology service was established in August 1953, following the recommendations of the APA Committee on Practicum Training.

Prior to the development of the hospital program, it was necessary to establish suitable professional positions in psychology through the state's Civil Service Commission. With the support of the Clinical Director, Administrator, and other personnel in the Department of Institutions, positions for professional psychologists, similar to those in the federal service, were initiated and approved. Prior to this time, the only psychological personnel employed by the Department of Institutions had been at a master's level. In June 1956, there were three full-time staff members in psychology, four fellows in psychology, two postdoctoral fellows in psychology, and one research fellow in sociology. Fellows in clinical psychology are appointed at four levels of training: (*a*) applicants who have completed two years of graduate study in an accredited university and have departmental approval for continuation to the doctorate; (*b*) candidates who have completed three years of graduate study; (*c*) those who have completed all requirements for the doctorate except the dissertation and the final oral examination; and (*d*) postdoctoral fellows, both in social and clinical psychology, who enter the hospital program to do further research or gain additional skills in the areas of psychotherapy, psychopathology, sociology, or social psychology. Tax–free stipends for these positions range from $2,200 to $4,500 per annum.

The present census of the hospital is about 360 patients. With the completion of new units, the hospital will have facilities for the care of an additional 150 patients. The psychiatric staff includes six full-time staff members and two residents. The social work department includes five psychiatric social workers and an additional staff member who carries out the important function of finding foster homes for the placement of convalescent psychiatric patients. The hospital presently provides field training for psychiatric residents, clinical psychologists, social psychologists, sociologists, and affiliate nurses; and the social service department shortly plans to inaugurate a program of field work placement for social work students.

The hospital is divided for organizational purposes into a male and female service for both white and Negro patients. Fellows in clinical psychology are assigned to each service and rotated at suitable intervals in order that they may achieve familiarity with the diagnostic and therapeutic problems originating in these services.

TRAINING IN DIAGNOSTIC SERVICES

Any staff member, resident or consultant, may initiate a request for psychological consultation; however, these referrals are not for routine evaluation, nor is there a standard psychological "battery" administered to each patient who is referred. The psychiatric staff usually have specific questions such as the evaluation of a patient's assets for psychotherapy, personality defenses, clarification of differential diagnosis, presence of organic pathology, or some other question that may be answered by psychological techniques. Both in the analyses of the test results and in the integration of the final report, an attempt is made to achieve an analysis of the patient's personality structure and defenses in the form of operational hypotheses. Since fellows in clinical psychology enter the hospital program at various levels, much of their supervision has to be an individual experience. The fellow's previous clinical experience in academic work is evaluated before he begins his work in the hospital program: assuming that he has finished his laboratory courses in the university setting, he is quickly introduced to patients.

Diagnostic psychological techniques are not utilized as ends in themselves but rather are oriented to enable the learning clinician to utilize such techniques to reveal a functioning individual. Fellows in clinical psychology will usually become quite proficient in diagnostic techniques through the standard "check out," observational, and supervisory procedures inherent in the learning process. The clinical fellow, after he has passed through his "check outs" and has been supervised both on his administration of tests and the integration of his findings into a satisfactory report, is responsible for the presentation and defense of the findings to psychiatric staff conferences. Thus, early in his professional training he is recognized, by his senior staff colleagues and those of other disciplines, as a professional associate.

There are other kinds of diagnostic experiences in which a fellow participates. A biweekly departmental seminar gives an opportunity for the fellow to present his findings and to interview his patient, at which time he may gain the benefit of group opinion. Ordinarily the patients present a diagnostic problem, although typical illustrations of frequently seen psychiatric syndromes are also presented. Other diagnostic opportu-

nities for the fellow in clinical psychology include the opportunity to observe and record during amytal interviews and prestaffing interviews at which time the psychiatric team makes decisions about the patient's course of treatment and physiological techniques, such as an EEG, depth interviewing by outside consultants, psychiatric staffing, and other procedures.

Special emphasis is given to the organization of the psychological findings into a comprehensive scientific report. The meaningful integration of these findings from the scientific analysis of clinical data is no mean problem for most psychologists in training or otherwise. In this hospital, we prefer a report that presents the dynamics of individual functioning rather than diagnostic categories—although, if this goal is attained, the diagnostic category should not be difficult to ascertain.

TRAINING IN PSYCHOTHERAPY

The hospital program offers several kinds of experiences in psychotherapy. While it is not our purpose to make a finished "psychotherapist" out of a practicum student, we have a deep conviction that a fellow should recognize the complexities of this area and should acquire a knowledge of his own limitations. The predoctoral fellow's experience in psychotherapy is carefully controlled by the psychological and psychiatric staff. At the postdoctoral level, a more intensive experience is possible with certain selected patients and the opportunity for adequate supervision. Excellent interprofessional relations and cooperation on the part of the psychiatric staff and visiting consultants have combined to make unusual opportunities for the fellow to participate in individual and group psychotherapy.

Experiences in psychotherapy for fellows at various levels are individualized in terms of the fellow's background, emotional adjustment, and previous experience. At the first level in training, it seems necessary to provide a beginning therapy experience which avoids as much as possible the likelihood of trauma to patient or novice therapist. An opportunity must be provided to the student to interact with a patient in a relatively controlled setting. At the beginning levels of fellowship training, it is the practice of this hospital to call this experience a dynamic case study. After conference with one of the psychiatric staff, a patient is selected whom we think will present an optimal learning situation from the student's standpoint and who will benefit from supportive treatment. The psychiatric and social history is carefully reviewed and the initial situation is structured to the beginning therapist as follows:

> With this patient you are not expected to do treatment or assume responsibility for the patient. Your primary mission is to get to know this patient and his life situation, and to attempt to derive hypotheses as to the dynamics of his behavior. These will include his needs, motivations, desires, and anything else that appears to be important for the patient. You will not be directly involved in the administrative handling of the patient, although the psychiatrist will usually want to discuss with you your contacts with the patient. You will have regular conferences with your supervisor.

In this study, depending upon the presenting situation, the supervisor may either observe the initial situation through a one-way observation screen or be physically present during the interview with the patient. Tape recording of all patient interviews during the early contacts is a requisite. In addition to this, there are two other forms which are a necessary part of the supervisory procedure.

The first of these is a protocol of the patient interviews which for convenience is divided into two parts: (*a*) a summary account of the content of the session with comments made by the therapist; (*b*) the student's formulation of the patient's dynamics and the recording of his own feelings toward the patient that have arisen out of the relationship. In the latter, we encourage the clinical fellow to "stick his neck out" with hypotheses of causation, motivation, or determination of the patient's behavior. Naturally, the hypotheses may be changed as therapy progresses, but it is often possible to "test" them clinically and to derive predictive indices for the patient's future behavior.

The second report is a periodic summary for the formal hospital record at which time an objective appraisal of the patient's progress is made. In addition to this, at regular intervals, the novice therapist's contacts with the patient are discussed with the patient's physician. The advantages of such an approach are fairly obvious. While relieving the clinical fellow of responsibility and minimizing the possibility of over-identification with the patient, it permits him to experience the basic process of relating to a patient, develop his observational skills, formulate his own ideas of the relationship of behavior to motivation, and to observe in himself his emotional feelings toward the patient. It is this latter area which constitutes a fundamental weakness of most nonanalytic training programs in psychotherapy. Most supervisory sessions actually entail working through the motivations of a beginning therapist as well as the patient. An efficient way of handling the above situation is of course to have the student therapist in treatment also, since his staff supervisor should not be involved with the student's own problems and often may not be able to deal with the anxieties that arise from older conflicts.

From this introduction to dynamics, which is actually supportive treatment, the fellow may progress to a more active treatment role. A wide range of neuropsychiatric patients, many of which are acute and admitted to a psychiatric hospital for the first time, present an unusual opportunity for experience. Should the fellow desire treatment for himself, hospital policy permits fellows in training sufficient time to secure therapy with a qualified analyst or other psychotherapist.

Supplementing the student's experience in individual therapy are two different forms of group therapy. The first of these, like the more traditional type of small group situation, is composed usually of 12 patients. There are some 16 groups presently active in the hospital. In some groups the therapist alone leads a group; in others, the recorder is also a therapist; and sometimes, there may be as many as three psychotherapists all sharing responsibilities for the group.

A more unique kind of group therapy situation with broadly defined objectives is called a ward meeting. This procedure follows, to a great extent, Maxwell Jones's "therapeutic community" idea in England. To a very great degree, responsibility is assumed by the patients for themselves, and traditional lines of authoritarian relationships are modified, if not entirely altered, so that staff and patients exercise a maximum degree of communication and responsibility. After a number of preliminary meetings among the staff, a "responsible worker" is designated for each ward meeting, although any of the psychiatrists, psychologists, social workers, nurses, attendants, or other personnel are free to attend and express whatever opinions or contributions to the discussion they feel appropriate. The situation is defined to the patients as being one in which they are free to discuss any ideas about themselves, the institution, the personnel, or anything that they so desire. Meetings on a very disturbed ward are planned to last about a half hour, followed by half-hour discussion among the personnel attending the meeting. The purpose of the latter meeting is to allow the staff to discuss problems originating in the ward meeting and to work through anxieties growing out of the situation.

The kinds of material developing from such a ward situation is quite varied. With disturbed patients, the discussion frequently consists of delusions or hallucinations which may be acted out directly. With more integrated patients, the productions are of more conscious material. On the basis of our experience, the ward meeting has proven to be a fruitful experience for both staff and patients and an excellent learning situation in group dynamics. Results paralleling those that Jones obtained with psychopathic patients have been experienced in this hospital with a broader patient population. It is expected that all fellows in clinical psychology will act as therapists, and some will assume major responsibility for the conduct of group therapy.

TRAINING IN RESEARCH

Our previous experience in trying to impart research techniques and a research orientation in a practicum situation has led us to the conviction that the best way to teach research techniques is to do research. Our hospital is fortunate in having an ongoing diversified research program. All of the fellows currently in the practicum program of this hospital take part in a variety of kinds of research.

Among the projects supported by state or hospital funds is a multidisciplinary investigation of systematically varying group treatment techniques with chronic schizophrenic patients. Recording is accomplished by sound motion pictures. Another hospital-wide project involves a symptomatic evaluation of the effects of chlorpromazine and reserpine with IBM analysis of the data. Other projects include a study of the effects of chlorpromazine and reserpine on anxiety and perception, a systematic study of delusion formation, a multidisciplinary study of Alzheimer's disease, and studies of the effects of diverse stimuli on cortical function.

In addition to current hospital research, students are encouraged to develop their own projects by means of a biweekly departmental research seminar. Third level fellows are allowed time and are expected to pursue their doctoral dissertations during their stay at the hospital. Fellows also participate in the hospital Journal Club which presents programs composed of current research or brings in outside speakers on significant topics.

Psychology in the News

A Matter of Degree . . .

Howard D. Tawney is the author of *Hypnosis and You,* published as a pocketbook. The jacket asks, "Does hypnosis prove reincarnation?" and "Is it true we'll never die?" Tawney is described on the red, black, and gold jacket as Chairman of the National Board of Psychological Examiners, President of the National Association of Hypnotists and Therapists, and Fellow of the International Institute of Psychology. His book includes "the complete case history of a subject who relived a life in ancient Egypt—and spoke the Egyptian language of 3,000 years before Christ."

Recently Paul V. Coates, columnist for the Los Angeles *Mirror-News,* reported that Tawney "offered to sell a degree of Doctor of Osteopathy" to an agent of the State Board of Examiners. Tawney was arrested immediately after the sale and charged with violation of the Business and Professional Code (Section 580) of California. California psychologists look forward to discovering whether Tawney can hypnotize a jury. Whether he can or not, they expect him soon to appear in another incarnation.

* * *

We Still Love Lucy . . .

George Lawton—the gentleman who authored the current best seller, *Straight to the Heart,* and who received his PhD in psychology at Columbia in 1936 and is a clinical diplomate—is sometimes described in the book reviews as a "lay psychoanalyst." Lucy Freeman, a friend of all the APA's, is one of the should-know-better writers who made this mistake. She is hereby sentenced to write ABEPP one hundred times on the convention Press Room blackboard.

When Hacks Meet Quacks . . .

Many magazine writers coming into the field of psychology to do a survey article start off with a query which APA Central Office members can now see coming a half mile away: "Say, maybe you could tell us about the quacks in this area." We know full well that the diploma mill characters and the "psychic counselors" are liable to enchant the average writer with an evil fascination, and the result will be another piece beginning: "Gullible Americans are being mulcted. . . ." We don't believe this builds confidence in psychology. Still, the general line has been that we would rather have writers learn from us than pick up their knowledge of quacks in the gutter. So we reluctantly open the files. Many more such articles, of course, are written without consulting APA. To a hack writer, these crystal ball operators are far more colorful than the real thing; it may take a little work to get to the color of this interesting pursuit.

So it is a partial victory to report on an article which, instead of starting out to be a piece on psychologists and detouring into quacks, *starts* with quacks and takes a large and authoritative excursion into what is a *real* psychologist. Optimists will say this is progress, and pessimists will say it goes to show. The article, "Beware of Psycho-Quacks," appeared in *Changing Times, the Kiplinger Magazine* for June. An early paragraph says:

> Before taking a harder look at the quacks and how they work, learn first about the men and women they are trying to imitate. The nation's 16,200 psychologists are highly trained scientists in an exacting profession.

The article was written by Lois Felder, not a hack, who had several visits with Central Office staff members. She submitted her article for fact checking before publication, and we hereby submit it to the membership for policy checking. You may or may not like this paragraph:

> Do the phonies ever help anyone? Strangely enough, they probably do occasionally. It is as a prominent psychologist once said, "The darndest things help people."

Insiders may recognize the identity of this prominent psychologist with the passion for accuracy. Two clues: he has seven children, and he undoubtedly did *not* say "darndest."

Dreams . . .

The July issue of *McCall's* ("the magazine of Togetherness") has an article, "What Do Your Dreams Mean," written by Ernest Havemann, the same writer who did the series on psychology for *Life.* The article is a general survey of what is known and conjectured about dreams. It men-

tions Havelock Ellis, Hans Ehrenwald, A. J. Cubberley, Sigmund Freud, Carl Jung, and Alfred and Gerhard Adler. It does *not* mention Calvin Hall, but some of the material seems to be from his vicinity. It concludes:

> Sometimes our more troubled dreams lead us to try to take stock of our inward problems, with or without the help of an analyst. All this is certainly true, no matter which school of psycho-analysis one chooses to accept.

The article does not mention those strange birds who may not accept *any* school of psychoanalysis. To do so might have disrupted the reader's feeling that students of human behavior have a basic togetherness.

H vs. E . . .

The recent work of Raymond B. Cattell, Glen F. Stice, and Norton F. Kristy was the subject of a United Press feature by Delos Smith, UP science editor. Smith dealt with their studies of identical and fraternal twins, as well as with siblings reared together and siblings reared apart. The United Press said:

> New scientific answers to the very old question of what parts of our personalities are inherited and what parts result from experiences and training have been given by three psychologists who made detailed studies of children.

Mens Sana in Mass Media . . .

Under the leadership of the Advertising Council, magazines, press, and radio are helping to publicize mental health goals and specifically urging people to write for a leaflet, "How to Deal with Your Tensions." This leaflet was written by George S. Stevenson, MD, with the assistance of Harry Milt, MA in psychology, who is Director of Public Relations of the National Association of Mental Health.

* * *

How to Say No . . .

A training course in nonviolence is being sponsored August 19–September 15 at Woolmandale Farm near Allentown, Pennsylvania. Sponsors are the "Peacemakers," a national pacifist movement based on Gandhian principles. Among the resource leaders is Robert Gilmore, the psychologist who is Executive Secretary of the New York Office of the American Friends Service Committee. The text for such a training program comes from Gandhi: "Non-violence is not a mechanical performance. It is the finest quality of the heart and comes by training."

—M. AMRINE

Psychology in the States

State Association Survey

Since developments in the state associations are proceeding apace, an attempt has recently been made to take inventory of current programs, practices, and problems. On the basis of survey returns received, the APA Central Office will shortly feed back to state association officers a summary of the results. Meanwhile, for the general information of all concerned, the following patterns may be of interest.

Individualism and Diversity. State associations have hardly been cast in a common mold. Their election dates fall in all seasons, their number of meetings per year range from one to eight (with one or two being the modal figure), they vary considerably in the degree to which they spawn "sibling" associations (of the city or county type), and they vary even more in the character of their public information activities. In some respects, the lack of uniformity is interesting and healthy; in others, it threatens good communication. The diversity in election dates, for example, makes a roster of officers obsolete by the time it sees the light of publication.

Common Concerns. Despite their individualistic style, however, state associations face rather universal problems and share common concerns. The enactment of legislation governing psychologists holds top priority on most agenda. Similarly, public information programs, by whatever name, receive their share of attention and debate. And, whether it be cause or effect, most associations still take very seriously the responsibility for a third area: the relative proportions in which scientific and professional concerns should shape their respective programs.

Identification with APA. Of 43 associations responding, 31 indicate that they have already discussed in detail the proposed "reorganization" of APA. The nature of the replies suggests that the discussions have proceeded without malice aforethought. Apparently the intent has been not to prejudge the issue but rather to air it thoroughly.

Public Information Programs. Of the 43 respondents, 34 are engaged in one or more forms of public information activity. The activities range all the way from issuing a directory to planning a vigorous, long-range, many faceted public relations program. While some associations may simply be going through the motions at this stage, others have already instituted imaginative, goal directed plans of action. Speakers' bureaus and directories—possibly the courses of least resistance—abound. Increasingly, however, there appear such measures as press secretaries, newspaper columns, telephone committees, and consultative services to public agencies and community groups. In one or two instances, associations actually maintain their own "Central Office" with all the additional devices which such an arrangement makes possible.

The several workshops scheduled for this year's APA convention should provide suitable forums for discussion of each of the foregoing areas. While "answers" will probably not emerge, the survey returns suggest that the psychologist in the states is now better than ever prepared to come up with good questions.

* * *

Psychologists and Health Insurance. Many group health insurance plans have extended their coverage to include treatment for psychological disorders. While this development is one that all the mental health professions can well applaud, some confusion has occurred over the role of psychologists in the treatment process. In some instances, claims filed with the insurance companies for services rendered by psychologists have been denied on the ground that the policy covers only treatment provided by bona fide medical personnel or expenses incurred on specifically medical prescriptions.

The situation is probably best interpreted as another opportunity for psychologists to educate an important segment of society, the insurance companies, about their own competencies, responsible behavior, and professional standards. Aside from the tradition of covering only clear-cut medical expenses, the insurance firms are primarily concerned with two quite legitimate questions. One is whether honoring claims placed for services offered by psychologists will increase costs; the other is whether any recourse is available in the event a psychological practitioner appears to be charging exor-

bitant fees or needlessly extending the treatment process.

While few trustworthy data are available, it seems likely that psychologists charge lower fees than psychiatrists for psychotherapeutic work. And the establishment of a legal certification procedure and the existence of an active and responsible ethics committee operating under an explicit ethical code make it clear that insurance companies have available an appropriate machinery for lodging complaints or making inquiry about psychologists whose clients are covered by health plans. If the insuring companies are to understand these mechanisms, however, they will have to hear them explained in a context of patience and friendliness. Obtaining proper recognition in the insurance world may require time, but it will come most rapidly if the problem is conceived in terms of the systematic and vigorous education of one's friends rather than as a duel between enemies.

Two Positive Steps Can Be Taken. Psychologists can make it a point to discuss this matter with their own insurance agents, asking them to provide information about the attitudes of their own firms toward psychology as one of the mental health professions and toward claims filed for services performed by psychologists. Such discussions, to be most helpful, must avoid rancorous arguments and concentrate on increasing the knowledge of insurance personnel about psychology and psychologists and cultivating cordial relationships that may one day permit easier direct communication with insuring companies. Second, any information about instances in which claims for services rendered by psychologists have been paid by insurance companies should be sent to: Edward J. Shoben, Jr.; Teachers College, Columbia University; New York 27, New York.

* * *

Queens Psychologists in Psychotherapeutic Practice. Thus entitled, a new association has been formed whose members are psychotherapists of advanced training and experience, residing or working in the vicinity of Queens County, New York. The dual purpose of the group is to acquaint people with the role, contribution, and qualifications of psychologists who practice intensive psychotherapy and to provide for professional communication among members.

Membership requirements for full status, in addition to New York State certification, include a minimum of two years of clinical experience in a treatment setting, personal analysis (300 hours or more), and supervised practice of psychotherapy (100 hours or more of training controls). A membership list and other details are available upon request from the Secretary of QPPP: Muriel Margolis; 88–30 182 Street; Jamaica, New York. The group has elected Myron H. Gordon Acting Chairman.

* * *

New Officers. The following rosters of officers have been announced by the respective state associations for the year 1957–58.

New Hampshire Psychological Association
President: Anthony R. Kraus
President-elect: Fred Jervis
Secretary-Treasurer: Frances Seward

Oregon Psychological Association
President: Richard A. Littman
President-elect: Lester F. Beck
Secretary-Treasurer: John L. Wallen

Rhode Island Psychological Association
President: Carl Pfaffman
Secretary-Treasurer: C. James Herrick

South Carolina Psychological Association
President: Harley A. Scott
President-elect: T. Roderick Hallum
Secretary-Treasurer: W. Frank Caston

—J. W. GUSTAD

Psychological Notes and News

The **American Board of Examiners in Professional Psychology, Inc.** conducted oral examinations for 78 candidates in New York, Chicago, St. Louis, San Francisco, and Los Angeles in the Spring of 1957.

The total oral examination included a Professional Field Situation and the following four parts:

1. Diagnosis or evaluation (definition of the problem faced by the professional psychologists)
2. Therapy and/or recommendations (how to deal with the professional problem)
3. Skill in the interpretation and use of research findings (what valid knowledge exists about the problem faced and how valid knowledge is obtained)
4. Organization and administrative problems of professional psychology (what are the conditions of acceptable professional practice)

ABEPP wishes to express its appreciation to the following Diplomates who served as members of its oral examining teams and who made special arrangements for Professional Field Situations:

Theodora M. Abel
Frances S. Alexander
Charlotte H. Altman
Kate S. Anderson
Marvin L. Aronson
Benjamin Balinsky
Dorothy W. Baruch
John E. Bell
Marianne Beran
Garret L. Bergen
Virginia L. Block
Hedda Bolgar
Lillie L. Bowman
Katherine P. Bradway
Roy Brener
Steuart H. Britt
Ruth L. Bromberg
Fred Brown
James F. T. Bugental
Bettye M. Caldwell
Rex M. Collier
Robert M. Eichler
Norman L. Farberow
Miriam Faries
Hanna F. Faterson
Herman Feifel
Jerome Fisher
Bertram R. Forer
Robert Foster
Sol L. Garfield
F. Harold Giedt
Harry B. Gilbert
Paul C. Greene
Milton S. Gurvitz
Florence Halpern
A. Arthur Hartman
Ralph W. Heine
Mack T. Henderson
Arnold H. Hilden
Howard F. Hunt
Theodore A. Jackson
Mary C. Jones
Goldie R. Kaback
David F. Kahn
Barbara A. Kirk
Seymour G. Klebanoff
Frank J. Kobler
Sheldon J. Korchin
Melvin Kornreich
Leonard Krasner
Samuel B. Kutash
Agnes T. Landis
Solomon Levine
Ida Linnick
Kenneth B. Little
Bernard Locke
William H. Lundin
Robert L. McFarland
Kathern M. McKinnon
Robert N. McMurry
Walter J. McNamara
Harry V. McNeill
Hyman Meltzer
Ivan N. Mensh
Christine M. Miller
Robert S. Morrow
John E. Partington
Julian Pathman
Alma A. Paulsen
Samuel Pearlman
Henry N. Peters
Wendell S. Phillips
Z. A. Piotrowski
Adam Poruben
Joanne E. Powers
Ernst Prelinger
Fred A. Replogle
Bernard F. Riess
Alan K. Rosenwald
Floyd L. Ruch
Milton Schwebel
Richard Sears
Clifford P. Seitz
Robert B. Selover
Helen Shacter
Laurance F. Shaffer
David Shapiro
Stewart B. Shapiro
Edwin S. Shneidman
Edward J. Shoben, Jr.
Phil S. Shurrager
Jerome L. Singer
John M. Stalnaker
Morris I. Stein
Bernard Steinzor
Barbara M. Stewart
Percival M. Symonds
William A. Thomson
Read D. Tuddenham
Ruth Valentine
Pauline G. Vorhaus
Herman R. Weiss
Mary Alice White
Walter L. Wilkins
Meyer Williams
Edith Wladkowsky
Zelda S. Wolpe
Wilson Young
Bohdan Zawadski
Philip Zlatchin

To assist in the conduct of its oral examinations for 1957, the board appointed the following Diplomates as Regional Coordinators of Examinations for the American Board of Examiners in Professional Psychology: in New York City, Bernard Locke and David Wechsler; in St. Louis, Ivan N. Mensh; and in Chicago, Robert L. McFarland.

Examining committees were chaired by present board members: Stanley G. Estes, Noble H. Kelley, Mortimer M. Meyer, Anne Roe, Fillmore H. Sanford, Harold C. Taylor, Austin B. Wood, C. Gilbert Wrenn, and George K. Yacorzynski; and former board members: Jean W. Macfarlane, Ruth S. Tolman, and David Wechsler.

Edgar W. Wilson, of Philadelphia, Pennsylvania, represented the APA at the Centennial Convocation of the National Education Association in Philadelphia on July 3, 1957.

Myra Kuenzel Brane, of Warren, Indiana, died in 1957.

Roy A. Miller, of Phoenix, Arizona, died in 1957.

Patricia Bergman Sorsby, of Richmond, Indiana, died June 7, 1957.

Louis C. Albright, Jr. has recently joined the staff of the National Science Foundation as Associate Personnel Director. He was formerly a staff Personnel Officer in the Office of the Chief of Finance, Department of the Army.

Joseph Andriola, formerly Associate Professor at the University of Oklahoma, has accepted a position as Chief Social Worker at Atascadero State Hospital, Atascadero, California.

Franklyn N. Arnhoff has accepted the position of Associate Research Scientist (Psychology) in the Mental Health Research Unit, New York State Department of Mental Hygiene, Syracuse, N. Y. He was formerly on the staff of the Salisbury VA Hospital.

Robert G. Bernreuter has been appointed Special Assistant to the President for Student Affairs at Pennsylvania State University.

Alvin J. Bernstein has transferred to the Heavy Military Electronic Equipment Department of the General Electric Company in Syracuse, New York where he is a personnel and training specialist in the System Utilization Unit of the Missile Guidance Section.

Ray H. Bixler is Acting Head of the Department of Psychology and Social Anthropology, University of Louisville while **Raymond A. Kemper** is on leave.

Joseph M. Bobbitt has been appointed Assistant Director of the National Institute of Mental Health.

John R. Martin Associates announces the appointment of **William T. Bourke** as a staff associate. He was formerly Chief Clinical Psychologist at the New Orleans VA Mental Hygiene Clinic.

Kurt Goldstein has accepted a professorship and **Richard Jones** and **Ulric Neisser** have accepted assistant professorships in the Department of Psychology at Brandeis University. Other members of the department are:

A. H. Maslow, Chairman; **Eugenia Hanfmann,** Director of the Student Counseling Center; and **Richard M. Held, James B. Klee,** and **Ricardo B. Morant,** Assistant Professors.

Steuart Henderson Britt has become Professor of Marketing in the Northwestern University School of Business and also the Managing Editor of the Journal of Marketing. He was formerly Administrative Vice-President of Earle Ludgin & Co.

Bernard J. Covner is Director of the new enterprise, Man-Management Center, Stamford, Connecticut.

Rolland Metzger has joined the staff of the Dixon State School, Dixon, Illinois as a Supervising Psychologist in charge of research. Other members of the staff are:

Robert H. Cassel, Chief Psychologist; **Anna P. Johnson,** Supervising Psychologist I; and **William H. Burns,** Psychologist II.

Alvin O. Bellak, formerly Chief Clinical Psychologist at the Aberdeen Proving Grounds, and **Stanley J. Benarick,** formerly Supervising Clinical Psychologist at the Coatesville VA Hospital, have joined the staff of Edward N. Hay and Associates. Other staff members are:

Milton L. Rock, Vice-President and Director; **John J. Grela,** Principal; and **Frank B. Martin, Jr., Edwin S. Raub,** and **Carol Fletcher Wagner.**

As of September 1957, the psychology department at the Emma Pendleton Bradley Home, Riverside, Rhode Island will include:

Anthony Davids, Chief Psychologist; **Max Talmadge,** Senior Psychologist; **Spencer DeVault,** staff psychologist; and **Morton Silverman,** psychology intern.

In October 1957, **Cyril M. Franks** will become the Director of the Psychology Department of the Neuro-Psychiatric Institute of Princeton, New Jersey.

Erich Fromm, Director of the psychoanalysis department of the medical school at the National University of Mexico, has joined the staff of Michigan State University to offer seminars and consultation in the social sciences and related fields.

Charles S. Gersoni, formerly in the Office of the Surgeon General, Department of the Army, has been assigned to the Walter Reed Army Institute of Research, Washington, D. C. The new Chief of the Human Resources Research Branch, OSG is **Charles W. Hill.**

Joseph J. Greenbaum has been appointed Associate Professor in the Department of Psychology of the Graduate Faculty of Political and Social Science in the New School for Social Research in New York City. He was formerly Assistant Professor of Psychology at Wesleyan University.

William W. Grings, Associate Professor at the University of Southern California, has been added to the Board of Consulting Editors of the *Psychological Newsletter.*

Syracuse University announces the appointment of **Calvin S. Hall** as Professor of Psychology. He will direct the clinical training program and serve as Executive Officer of the Psychology Department.

Frederick J. Heimlich has resigned as Director of the Psychology Department in the Norman M. Beatty Memorial Hospital to accept an appointment as Chief Clinical Psychologist in the Guidance Clinic, Orlando, Florida.

Charles Kram has been appointed Chief Psychologist for the Division of Mental Health, Texas State Department of Health.

A $2,500 scholarship has been established at Northeastern University, Boston in honor of the late **A. Aaron Leve,** former member of the Psychology Department. Created as an annual award, it will be presented to an outstanding student majoring in Psychology at Northeastern. Funds were contributed by students, faculty members, friends, and members of the Leve family.

In September, **Louis Levine** is resigning as Director of the Department of Psychology, San Francisco State College.

Henry T. Moore has retired from the presidency of Skidmore College and is now living in Glens Falls, New York.

John T. Palmer has been appointed Coordinator of Advisement and Associate Professor of Education at the San Francisco State College beginning in September 1957. He was Director and Head Counselor of the Veterans Guidance Center, University of Southern California, Los Angeles.

Eugene S. Gollin, formerly at the University of Minnesota, has joined the Department of Psychology at Queens College as Assistant Professor. The department now includes:

Gregory Razran, Chairman; **Edward M. L. Burchard, Joseph Miller,** and **Emma Spaney,** Associate Professors; **Milton W. Horowitz, Nicholas J. Pastore,** and **Wilma A. Winnick,** Assistant Professors; **Arnold Bernstein, Mary Reuder,** and **Arthur A. Witkin,** Instructors; and **Harry Beilin, Jack Bernard, Norman Gordon, Emily Philpott, Joseph Vaccaro,** and **Pierre A. Ventur,** Lecturers.

Arthur Riopelle, formerly at Emory University, has been appointed Chief of the Department of Psychology, US Army Medical Research Laboratory, Fort Knox, Kentucky.

Carl R. Rogers has accepted a joint appointment as Professor in the Departments of Psychology and Psychiatry at the University of Wisconsin. He will be engaged in research in psychotherapy and in the training of clinical psychologists and psychiatrists. The Counseling Center of the University of Chicago, of which he has been Executive Secretary, will continue with **John M. Butler** as Executive Secretary.

John H. Rohrer has resigned from Tulane University to accept a position as Professor of Psychology in the Department of Psychiatry, Georgetown University Medical School, Washington, D. C.

Rohrer, Hibler & Replogle announces the appointment of **Grant R. Gaines** to the staff of the San Francisco office, **Ralph E. Jenson** to the Los Angeles office, **Edward H. McAlister** to the New York office, and **John R. Thurston** to the Milwaukee office of the firm.

Louis M. Rosenberg has resigned his position as Staff Clinical Psychologist, Brooklyn VA Mental Hygiene Clinic to enter private practice in New York City.

The staff at State Hospital No. 1, Fulton, Missouri now includes:

C. Scott Moss, Psychology Director; **Maurice J. Moran,** Assistant Psychology Director; **William R. Morrow,** Research Coordinator; **Gale L. Fuller, Lyman M. Riegel, LeRoy H. Rook, Mary Margaret Thompson;** and **Andrew Berger** and **Thomas J. Waters,** Trainees.

Donald L. Thistlethwaite, formerly at the University of Illinois, has been appointed Associate Director of Research for the National Merit Scholarship Corporation, Evanston, Illinois.

Robert Thompson, formerly at Louisiana State University, has joined the staff of Southeast Louisiana Hospital, Mandeville, Louisiana.

Robert Y. Walker has joined the staff of the Human Factors Group of the Boeing Airplane Co., Seattle Division.

Leo Charles Ward, Jr. has been appointed Director of the Charles L. Mix Memorial research project in mental disease established at the Americus-Sumter County Hospital.

William Marshall Wheeler, part-time associate formerly in the London office of Edward Glaser & Associates, is returning to the Pasadena office to engage in child therapy and research in the Reiss-Davis Clinic for Child Guidance similar to his work in the Hampstead Child Therapy Course and Clinic in London.

The **American Foundation for the Blind** has made the following research fellowship awards for 1957:

Seymour Axelrod of New York University for the completion of his doctoral research, Sensory Discrimination and Learning of Complex Tasks Based on Tactual and Auditory Stimuli.

Sadako Imamura of Harvard University for her doctoral dissertation, Influence of Child Training Practices on the Blind Child.

Harvey Kramer of the University of Rochester for his doctoral research, A Study of Variables Related to Auditory Projection.

Arthur H. Parmelee, Jr. and **Claude E. Fiske, Jr.** of the University of California at Los Angeles for their research, A Developmental Evaluation of Blind Infants and Children.

John C. Sherman and **Sidney S. Culbert** of the University of Washington and **Willis R. Heath** of the University of Chicago for their research, Discriminability of Textural Patterns and Tactual Figures.

Philip Solomon of the Harvard Medical School for his research, Relationship between Sensory Isolation and Blindness.

A three-year program of teaching, research, and training in **educational psychology** will be supported at Northwestern University by a grant of $156,000 from the Carnegie Corporation of New York. Faculty members of both the school of education and the department of psychology will join together to develop new courses in educational psychology which will include more knowledge of basic research on human behavior than is provided in the usual teacher training curriculum.

A grant of $120,000 has been made to New York University for a two-year study of the factors determining the **institutionalization of retarded persons.** The goal of the study is to find out whether institutionalization constitutes the best possible solution for different groups of retarded persons now usually sent to institutions.

The Manual for the Allport-Vernon-Lindzey **Study of Values** is currently being revised. The authors are eager to secure any additional normative data that may be available. Results for almost any identifiable group (college, school, industry, occupation) are of interest. The data may be sent directly to: Gordon W. Allport; Department of Social Relations, Harvard University; Cambridge, Massachusetts.

A list of **visiting Fulbright scholars** who are available for occasional lectures and short visits has been prepared for distribution by the Committee on International Exchange of Persons. The list gives the name and position of each scholar in his home country, his address in the United States, and suggested subjects or fields for lectures. Requests for the list should be addressed to: Conference Board of Associated Research Councils; 2101 Constitution Avenue, N.W.; Washington 25, D. C.

O. E. Lowenstein, of the Department of Zoology and Comparative Physiology in the University, Birmingham, England, has received a traveling grant from the Rockefeller Foundation for a five-month stay in the United States beginning in August. He will be at Woods Hole, Massachusetts until mid-September. He has brought with him material for special lectures on the following topics: comparative physiology of the otolith organs, peripheral mechanism of equilibrium, proprioception in insects, spontaneous activity in sense organs, work on sensory physiology in Birmingham, biological antitheses, man's attitude towards animals, and communication among animals.

The fourth semiannual **VA-University Conference** was held on May 21, 1957 with the VA Regional Office, Baltimore, Maryland as host. The guest speaker was James G. Miller who spoke on

"The Normal Personality and General Behavior Systems Theory." Reports and findings of research programs in psychotherapy will be the topic of the fifth conference to be held at the University of Maryland, College Park, Maryland in November 1957.

The twenty-second **Educational Conference** will be held on October 31 and November 1, 1957 at the Roosevelt Hotel in New York City. The theme of the conference will be "Long-Range Planning for Education." Among the topics to be discussed are: educational values, changing values and attitudes on the campus, education beyond the high school, institutional problems in long-range planning, use of tests in admission, and planning to assure reading skills. For further information, write to: Arthur E. Traxler; Educational Records Bureau; 21 Audubon Avenue; New York 32, New York.

The New York Medical College is starting its second **Postgraduate Training Program in Mental Retardation,** September 25, 1957. Trainees will be offered either part-time or full-time didactic as well as clinical experience in the field of mental retardation. Communications should be addressed to: Faculty Committee, Department of Pediatrics; Postgraduate Training Center in Mental Retardation; Flower and Fifth Avenue Hospitals, New York.

The **American Psychosomatic Society** will hold its fifteenth Annual Meeting at the Netherland Hilton in Cincinnati on March 29–30, 1958. The Program Committee would like to receive titles and abstracts of papers for consideration for the program no later than November 15, 1957. The time allotted for presentation of each paper will be 20 minutes. Abstracts of the papers in octuplicate should be submitted to: Theodore Lidz, Chairman, Program Committee; 551 Madison Avenue; New York 22, New York.

The **Canadian Psychological Association** maintains an *Employment Bureau* to serve as a medium between employers and potential employees. Employers, while invited semiannually to list their current vacancies, may forward vacancy notices throughout the year, descriptions of which will be circulated among psychologists. Likewise, information pertaining to psychologists who are seeking employment will be made available to employers. All CPA members, members of provincial and regional associations in Canada, Canadian university departments of psychology, and other psychologists are on the bureau's mailing list. Minimum requirements for listing are: the MA degree in psychology or its academic equivalent OR successful completion of one year of graduate study plus one year of full-time work in psychology. While there is no charge to the employer or the psychologist for the bureau's service, only positions in Canada or with Canadian employers will be listed. Address all inquiries and correspondence to: Herbert Dörken; Department of National Health and Welfare; 602 Jackson Building; Ottawa, Ontario. Quote file number 435-12-2.

The **Council of Psychoanalytic Psychotherapy** will hold its first general meeting at 1:30 P.M., October 26, 1957 at the Carnegie Endowment for International Peace, United Nations Plaza, New York City. The council is composed of practicing psychoanalysts of varied theoretical orientations. Members of this group are drawn from the fields of medicine, social work, and psychology. Persons interested in joining the council are invited to attend the meeting. Inquiries regarding membership should be addressed to: Ivan Wentworth-Rohr; 270 West End Avenue; New York 23, New York.

The **Southern Regional Council on Mental Health Training and Research** met on June 28–29, 1957 to consider several proposed projects: an experiment on the education of the mentally retarded, exchanges of personnel among mental hospitals for inservice education, and a study on the economic value to states of providing adequate mental care. Members of APA elected to the Executive Committee of the council were Mary Carl and Nicholas Hobbs.

Convention Calendar

American Psychological Association: August 30–September 5, 1957; New York, New York

For information write to:
Roger W. Russell
American Psychological Association
1333 Sixteenth Street, N.W.
Washington 6, D. C.

American Institute of Biological Sciences: August 25–29, 1957; Stanford, California

For information write to:
American Institute of Biological Sciences
2000 P Street, N.W.
Washington 6, D. C.

American Sociological Society: August 27–29, 1957; Washington, D. C.

For information write to:
Matilda White Riley, Executive Officer
American Sociological Society
New York University, Washington Square
New York 3, New York

American Physiological Society: September 2–5, 1957; Iowa City, Iowa

For information write to:
American Association for the Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington 5, D. C.

International Conference on Operational Research: September 2–6, 1957; Oxford, England

For information write to:
Thornton Page
Operations Research Office
7100 Connecticut Avenue
Chevy Chase 15, Maryland

American Statistical Association: September 10–13, 1957; Atlantic City, New Jersey

For information write to:
American Statistical Association
1757 K Street, N.W.
Washington 6, D. C.

American Council on Education: October 10–11, 1957; Washington, D. C.

For information write to:
American Council on Education
1785 Massachusetts Avenue, N.W.
Washington, D. C.

Institute of Management Sciences: October 17–18, 1957; Detroit, Michigan

For information write to:
Donald Jennings
67 Broad Street
New York 4, New York

Academy of Psychosomatic Medicine: October 17–19, 1957; Chicago, Illinois

For information write to:
William S. Kroger, Secretary
104 South Michigan Avenue
Chicago 3, Illinois

Fourth Pan American Pharmaceutical and Biochemical Congress: November 3–9, 1957; Washington, D. C.

For information write to:
Office of Sscientific Information
National Science Foundation
1520 H Street, N.W.
Washington 25, D. C.

American Group Psychotherapy Association: November 19–20, 1957; Los Angeles, California

For information write to:
Richard Sears
49 Fourth Street
San Francisco, California

American Association for the Advancement of Science: December 26–30, 1957; Indianapolis, Indiana

For information write to:
Raymond L. Taylor
American Association for the Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington 5, D. C.

A calendar of international conventions was given in the January 1957 issue of the *American Psychologist*

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